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COMPUTERWORLD

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NEWSPAPER

Benchmark battle escalating

BY STANLEY GIBSON
CW STAFF

IBM cried foul in the Debit/Credit benchmark contest last week, claiming that its machines perform three times faster than Digital Equipment Corp. said they do.

In addition, IBM said it will probably join the Transaction Processing Performance Council, a group of hardware and software vendors attempting to define transaction processing benchmarks. IBM may also submit its proprietary Ramp C benchmark to the council for adoption as a standard.

IBM's response came after DEC ran Debit/Credit tests on both DEC and IBM equipment and released performance figures in July. Those results gave DEC a substantial price/performance advantage over IBM.

Although DEC said then that it would issue a full report this month on its tests, the firm now says it will not meet that deadline because it is rerunning the tests for an external auditor and wants to see the TPPC's full definition of Debit/Credit.

IBM said it will publish by Nov. 1 an auditor's report written by Tom Sawyer, a senior consultant at the Codd and Date Consulting Group in San Jose, Calif. Any solid conclusions about the validity of either test must wait until the full reports are available, observers said.

"This is pure FUD [fear, un-

Continued on page 133

DEC will sell Dbase on VAX

BY DOUGLAS BARNEY
CW STAFF

BOSTON — No one batted an eye earlier this month when Ashton-Tate Corp. quietly revealed plans to port Dbase to Digital Equipment Corp. VAX computers. But a few eyebrows may rise today when DEC and Ashton-Tate announce a deal that will give DEC the right to price, name, sell and support the Dbase software.

The first deal DEC has struck with any of the Big Three personal computer software firms calls for Ashton-Tate to develop Dbase for the full line of VAX computers, according to industry sources. In a move unlike its agreements announced last week with Oracle Corp., Relational Technology, Inc. and Informix Software, Inc. (see story

Continued on page 8

Ax falls hard at ADR

CA fires 500; users ponder Datacom DBMS fate

BY CLINTON WILDER
CW STAFF

PRINCETON, N.J. — Flexing its awesome software industry muscle, Computer Associates International, Inc. last week terminated both Applied Data Research, Inc.'s name and 500 of its 1,730 employees.

Following its time-tested pattern after a major acquisition, CA moved swiftly to consolidate the acquiree's operation within its own, notifying laid-off employees of their fate within one week of finalizing the merger.

CA created a new Information Products Division, headquartered here, that combines virtually all of ADR's product line with CA's programmer productivity products, including CA-Optimizer, CA-EZtest and the database management system CA-Universe. The division also includes CA's graphics software products, acquired in the 1986 buyout of San Diego-based Issco.

Two ADR systems management products, Look and Mindover MVS, will be transferred to CA's Systems Products Division at CA headquarters in Garden City, N.Y.

ADR customers interviewed last week expressed concern about the future of ADR's flagship mainframe DBMS, Datacom/DB. Many of them will get a chance to learn more firsthand this week when CA Chairman Charles B. Wang and other top executives attend the Cadre ADR users group meeting in Atlanta.

A new release of Datacom is currently at beta-test sites and was scheduled for a Nov. 30 announcement. Wang, in an interview, did not comment specifically on Datacom but said all ADR product development schedules will be reviewed.

"What we don't want to do is come out with products prematurely," Wang said. "If we have to hold up a product for more fea-

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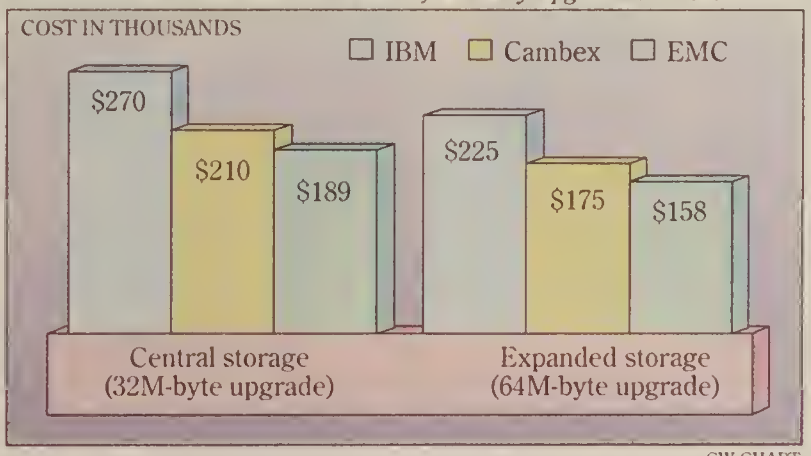
Three's company

IBM 3090 users now have a choice of memory upgrade vendors



CW CHART

For the first time, IBM's customers have sources for 3090 memory upgrades other than IBM. But even lower costs may not induce buyers to switch brands. See story page 133.

Budget time, and the livin' ain't easy

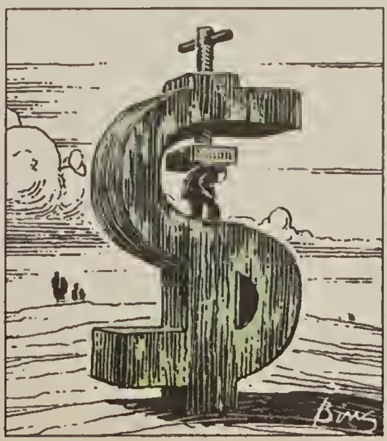
BY DAVID A. LUDLUM
and JAMES CONNOLLY
CW STAFF

Caution and, on occasion, gloom keep showing up in MIS executives' comments: "Times are tough." "My whole industry is down." "It's so hard to come back from a takeover attempt." Even the optimists in businesses such as insurance sound conservative; they say 1989 will be a recovery year or, at best, business as usual — not boom times.

Recent interviews with randomly selected MIS executives reveal a pattern that shows few growth opportunities in 1989 budgets and many MIS shops fighting to keep budget cuts — and long-term damage — to a minimum.

Across industries, firms are trying to hold the line on MIS spending. But they continue to invest in systems they consider strategically important.

"People are getting most everything they want, but we're cutting back the excess. Nobody's getting fat on computer equipment, but nobody's really hurting that much, either," says Gordon Griffith, director of corporate budget and financial planning systems at Montana Power Co. in Butte.



David Karney, vice-president of MIS at Southland Corp. in Dallas, adds, "This year and last year, our budget considerations have been driven by the need to cut costs." Southland, rebuilding after a leveraged buyout two years ago, has cut costs throughout. "What you wind up doing in that situation is deferring new projects and figuring out ways to squeeze

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GEORGE DiNARDO
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A bad report card

MIS pros confer low grades on software, services

BY CLINTON WILDER
CW STAFF

DALLAS — The software and services industry asked several prominent MIS professionals last week to publicly answer Mayor Edward Koch's famous question, "How am I doin'?" The overall response was, "Not so great."

In two panel sessions at the biannual ADAPSO Management Conference here, information systems executives from large firms such as Allied-Signal, Inc., Frito-Lay, Inc. and Mellon Bank NA gave the users' perspective on software and services issues such as customer support and product quality.

"By and large, you're lousy," said George DiNardo, the outspoken executive vice-president of Mellon Bank. "I'm about 50% satisfied with the software products and 60% satisfied with the hot-line support."

Panelists told ADAPSO members that they could better serve the MIS community in the following specific areas:

- Understanding customer needs. Sale of a software package to a shop that really does not need it will do more damage to the vendor-client relationship than the sale is worth, said Larry Beckner, MIS director of Allied-Signal's Garrett Division, an aerospace unit in Phoenix.

"Nobody wins when the vendor ignores our current hardware and software operating environment, policies and culture," Beckner said.

- Providing better documentation. Several panelists insisted that vendors provide on-line product documentation instead of, or in conjunction with, printed manuals.

"Have you ever tried to find all the copies of a manual at a client's site?" asked Wayne J. Saydin, director of MIS at Dallas-based Murray Financial Corp.

- Keeping users better informed on future product plans and directions. One microcomputer support manager praised Lotus Development Corp. for keeping her informed on the progress of the much-delayed Release 3.0 of 1-2-3 and showing her initial versions of the product as early as February.

"Knowing the release date is not that important," said Linda Musthaler, a Computer Sciences Corp. consultant at the information center of the National Aeronautics and Space Administration's Johnson Space Center. "What impresses me this time is that [Lotus] shows it understands my needs."

- Focusing first and foremost on user integration issues. "We're less and less interested in 'better' products," said Stephen Gleave, director of systems development at Dallas-based Frito-Lay. "We're interested in long-term partners and how we will integrate."

Allied-Signal's Beckner echoed similar sentiments. "Customer satisfaction is more important than quality," he said. "I appreciate a vendor telling me what they don't do well, giving an honest representation of their capabilities."

Perot can compete, court says

BY MITCH BETTS
CW STAFF

FAIRFAX, Va. — The bitter feud between H. Ross Perot and Electronic Data Systems Corp. (EDS) took a new turn last week when a Virginia judge ruled that the upstart Perot Systems Corp. can compete with EDS on a nonprofit basis through Dec. 1, 1989.

Perot declared victory after the judge clarified that the ruling allows Perot to later convert nonprofit contracts to profit-making ones. Also, Perot can continue hiring EDS personnel in pursuit of data processing and systems integration contracts.

The ruling, made in Fairfax County Circuit Court, responded to an EDS request for an order preventing Perot from violating his noncompete contract with EDS parent company General Motors Corp. [CW, Oct. 3]. In four days of hearings, EDS argued that the contract limits Perot to charitable work, but the judge said the contract failed to include that language.

When Judge William J. Plummer first issued his order, EDS thought it had won the victory because he issued a temporary injunction preventing Perot from competing on a for-profit basis through Dec. 1, 1989. But the clarification, allowing Perot to later seek profitable contracts with the same customers, made the EDS victory a hollow one.

The feud, however, is not over. A full trial on the suit is expected to begin on April 6, and hearings will soon begin on Perot's countersuit in Texas, which seeks a court order preventing EDS from obstructing Perot's effort to win clients [CW, Oct. 10].

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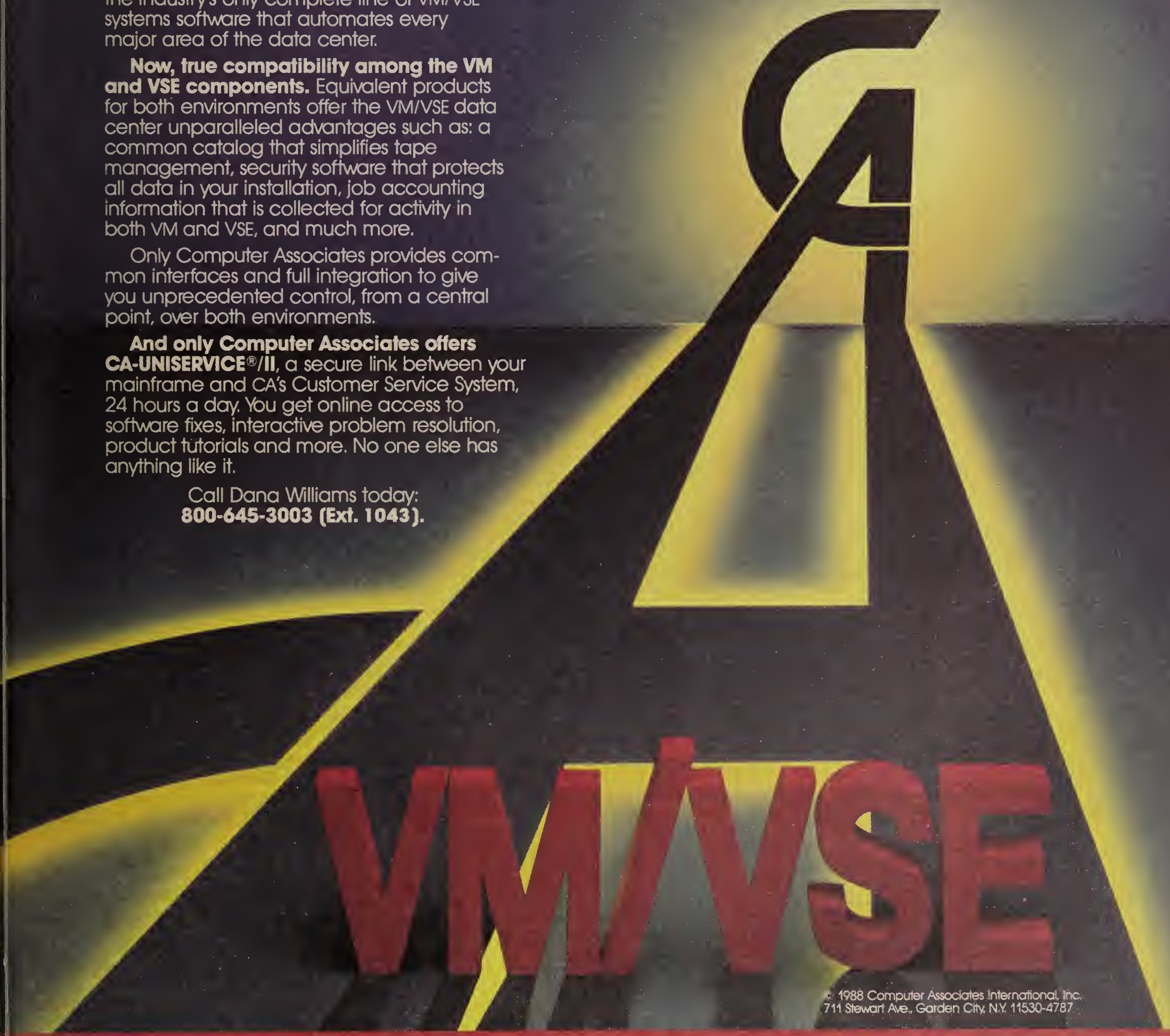

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Unisys ties controllers into IBM SNA networks

BY JEAN S. BOZMAN
CW STAFF

LOUISVILLE, Ky. — Unisys Corp. came to the Use, Inc. meeting of 1100/2200 mainframe users last week bearing several gifts. During the weeklong conference here, Unisys announced a mid-range Distributed Communications Processor (DCP) and a software product, SNAnet, that allows DCP controllers to play the part of IBM 3725 controllers in an SNA network.

The DCP 30 processor is a replacement of the 9-year-old DCP 40, which is being discontinued, said Brian Pickersgill, a program manager at Unisys' central Corporate Program Management office in Blue Bell, Pa. "It is an extension of DCP 50 technology in that it uses the same cabinets and modules, the same I/O peripherals and the same maintenance controllers as the DCP 50," Pickersgill said.

New gate-array technology makes the DCP 30 three times faster than the low-end DCP 15 and one-third as fast as the high-end DCP 50, Unisys said. The DCP 30 was designed to support 160 lines at speeds of 45 transaction/sec. The 64-in.-high unit, which can be used in an office, is priced at $97,824 for a basic system. It is field-upgradable to a DCP 50 through replacement of the central processing boards and the addition of another cabinet, Unisys said.

Parity case?

The SNAnet software provides parity with IBM's PU5 specification and can run under a Unisys host supporting IBM's LU6.2 standard (see chart). The result is that Unisys customers can use DCP front ends for IBM's Systems Network Architecture (SNA) networks or for Unisys' own Distributed Communications Architecture (DCA). This two-way capability is strategically important, since many Unisys mainframes are sited in IBM shops.

"This enables us to send communications across an SNA network without going through the IBM mainframe's Host Command Facility," said Unisys program development manager J. Daniel Gansz.

He added that SNAnet has four parts: a base product, a crossover product that allows connections to IBM or Unisys hosts, support for X.25 packet-switched networks and support for bisynchronous communications. "We believe most users will buy the base and crossover products together," he said, "and that the X.25 and bisynchronous support will be additional options."

For the last three years, Unisys had supported IBM's PU2 communications only on its older SNA Gateway product. "We're expanding that concept to fully participate in IBM's SNA network," Gansz said. SNAnet can be purchased or leased on a monthly basis.

Deliveries are scheduled to begin early in 1989. SNAnet is priced at approximately $21,000 for the DCP 10 and DCP 15 front-end processors and at about $60,000 for the DCP 30 and DCP 50 processors.

Users present in Louisville seemed pleased with the product introductions, commenting on the DCP 30's hot-board-removal features. The feature allows operations personnel to remove and replace a faulty board without interrupting the system.

Such details were not lost on the 1,000-plus Use attendees, said former Use President Joanna Broder. "People at Use have a technical orientation," she said. "They are interested in how-to issues and in having Unisys machines coexist with hardware from other vendors."

CA shows up

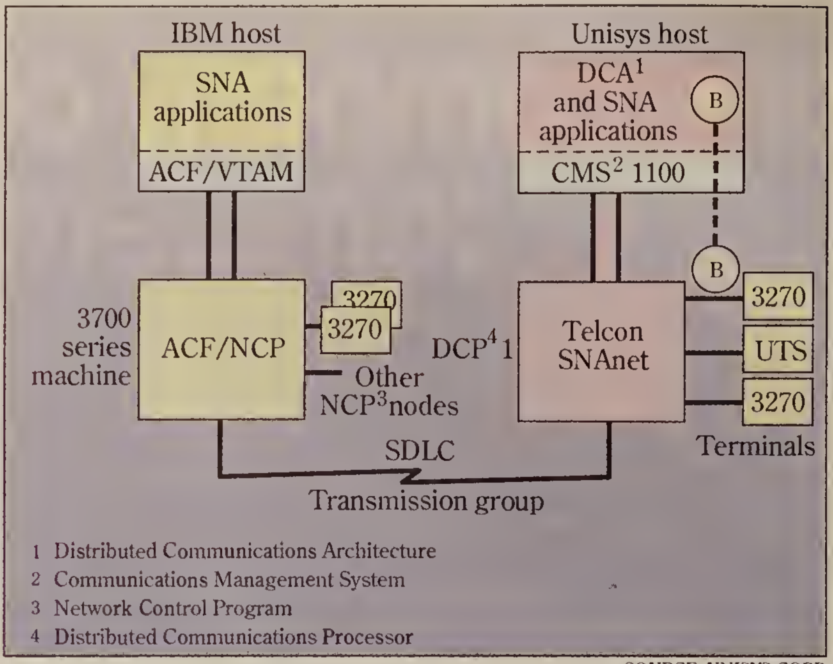
Other vendors also chose to introduce products for the 1100/2200 mainframe market at Use. Among them was Computer Associates International., Inc., which announced that it had rewritten nine IBM-compatible financial packages for Unisys 1100/2200 computers. CA, which signed a cooperative marketing agreement with Unisys in August, said Unisys versions of its Advanced Business Software (ABS) packages will be available by year's end.

"ABS products provide real-time, on-line applications that will fit well with Unisys transaction-oriented customer sites," said Phillip C. Burckle, group sales manager in CA's Los Angeles office. The ABS applications include packages for general ledger, accounts payable, accounts receivable, fixed assets, order-entry purchasing, inventory control and job-costing.

Burckle said CA has a group of 20 developers in Salt Lake City dedicated to writing applications for the Unisys 1100/2200 market. CA acquired a number of Unisys-compatible products when it bought Issco in San Diego., Software International in Andover, Mass., and Uccel Corp. in Dallas. Next year, CA plans to announce a series of application packages for Unisys System 80 OS/3 systems, Burckle said.

Let's talk

Unisys offerings allow the company's DCP controllers to act like IBM controllers in an SNA network



1 Distributed Communications Architecture
2 Communications Management System
3 Network Control Program
4 Distributed Communications Processor

SOURCE: UNISYS CORP.

Unisys upgrade update

Hollis L. Caswell, Unisys' senior vice-president and president of the company's product and technology division, said last week that the company is already at work on a new processor for its just-announced 2200/600 top-of-the-line mainframe.

However, Caswell also reported that the ship target for 2200/400 mainframes, announced in March, has slipped from the first quarter of 1989 to the second quarter due to "testing requirements." The system has shown some unreliability in complex I/O configurations, he said.

Code-named "Mercury," the new very large-scale integration chip for the 2200/600 is under development at Unisys' Roseville, Minn., laboratory, Caswell told hundreds of attendees at the Use, Inc. conference of 1100/2200 mainframe users. "This development reflects the commitment Unisys has made to enhance the 1100/2200 line," Caswell said. The 2200/600, which runs at 15 to 55 million instructions per second, was announced Sept. 19.

Not the end of the line

Unisys developers are using new computer-simulation technqiues to aid them in designing the Mercury chip, Caswell disclosed. But Mercury probably will not be the last boost for the 1100/2200 line. "At any point in time, we're working on a product that's three releases out," Caswell commented to *Computerworld* after his keynote speech.

During his address, Caswell also hinted at another product awaiting volume sales: Unisys 5090 and 8490 disk drives for mainframe systems. High-end units are in early release in Europe, but shipments are only beginning in this country, Caswell said. A cache version of the high-capacity drive is scheduled for shipment by year's end.

Caswell also responded to user claims that Unisys' ordering system for parts and systems is inefficient and unreliable. "The merger of two $5 billion corporations [Sperry Corp. and Burroughs Corp. in 1986] placed a strain on our distribution systems that we did not anticipate," Caswell explained. Now, he said, "many of the merger-related problems are yielding to a management focus on them."

To solve the problem, Unisys has instituted spot-checks that pull crates and boxes of systems off the loading docks at random.

Workers then verify that all ordered parts are enclosed, Caswell said. In addition, shipments of software and documentation are checked at Unisys' Plymouth, Mich., publications facility.

Personal computer products and parts are now shipped from a new central location in West Chicago, Ill. That move was made to prevent PCs from getting lost in complex orders of mainframes, peripherals and personal computers.

JEAN S. BOZMAN

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NEWS SHORTS

Do as I say, not as I do

A survey of 300 data processing professionals found that 99% believe an education program about the societal and legal consequences of computer crime would help reduce abuses but that only 38% of the firms have such a program. The survey, sponsored by the Information Resources Management Association in Middletown, Pa., also reported a surprisingly high level of security lapses. Asked how frequently their computer systems are breached, 47% of the respondents said "very often" or "always." Of the remainder, 6% said breaches occur "often," 38% said "seldom" and 9% said "never."

……

Sony first with erasable disk

The race to provide a commercially available rewritable optical disk drive looks like it posted a winner last week when Sony Corporation of America announced large-scale production of its SMO-D501, a 5¼-in. rewritable optical disk drive, and the SMO-S501 associate subsystem. The disk drive offers both a data transfer rate of 7.4M bit/sec. and a 20-msec seek time and will sell for $4,650, the Park Ridge, N.J.-based firm said. Similar general availability offerings are planned from both Canon U.S.A., Inc. and Maxtor Corp., according to Disk/Trend, Inc., a Los Altos, Calif.-based research firm.

……

LSI ups stake in Video Seven

LSI Logic Corp. raised its 20% stake in Video Seven, Inc. last week by acquiring an additional 50% of the stock from Intelligent Systems Master Ltd. Partnership for $9.9 million in cash. Although LSI's purchase of an additional 3.2 million shares of Video Seven gives it controlling interest in the personal computer graphics adapter manufacturer, LSI said it will continue to operate the Fremont, Calif.-based firm as a freestanding company and that Paul Jain will remain as president and chief executive officer of Video Seven.

……

Bell Atlantic joins E-mail fray

Bell Atlantic Corp. announced last week that it will offer an electronic mail service jointly with Telenet Communications Corp. Bell Atlantic Mail will target residential and small business customers, who will access the service through the regional holding company's videotex gateway service, which has already been approved by the Federal Communications Commission. Telenet will provide the actual mailboxes as well as access to subscribers on its own Telemail service as well as to mail services that comply with the X.400 electronic messaging standard, Bell Atlantic said. Pending FCC approval, the service is expected to be introduced late this year in Philadelphia, with a Washington, D.C. introduction scheduled for early next year.

……

Postscript for mainframe printers

Users of Adobe Systems, Inc.'s Postscript may now print their documents on IBM mainframe printers, Adobe announced last week. A Postscript interpreter that runs under IBM's VM/CMS provides the capability. Postscript language documents created on personal computers or large IBM systems can be printed on IBM's Postscript or ASCII front panel printers, and documents will have identical appearances across IBM's 240, 300 and 600 dot/in. printers. A week earlier, Adobe, based in Mountain View, Calif., announced that IBM had licensed Display Postscript for incorporation into its AIX operating system.

……

Northern Telecom profits nose-dive

Northern Telecom, Inc. CEO Edmund Fitzgerald blamed shifts in shipment schedules and lower demand from Europe for the company's disappointing third-quarter earnings, reported late last week. Net earnings were down 16% to $56 million, compared with $66 million for the third quarter of 1987. Revenues rose to $1.23 billion, which is a 6% rise. Fitzgerald reiterated the company's expectations of a fourth quarter sufficiently strong to pull out "revenue, earnings and margin improvements for all of 1988 when compared with the previous year."

Microvaxes target small business

BY ROSEMARY HAMILTON
CW STAFF

Digital Equipment Corp. took its latest shot at the small business market last week with two Microvaxes it claims can outperform certain models of what is currently considered one of the hottest mid-range systems, the IBM Application System/400.

Analysts considered the new DEC computers, the Microvax 3300 and 3400, as solid additions to the Microvax product line. While they are not breakthrough products, they will give DEC more ammunition in its challenge against IBM and other small business system providers, analysts said.

"It will take DEC a step further, but everytime they get in the door of an IBM account they still have to answer the question, 'Why should I buy this instead of an AS/400?' " said Bob Randolph, director of program services at the research firm TFS, Inc. in Westford, Mass.

The way they look now

The new systems, available immediately, will replace three higher end configurations of the Microvax II system. The revamped Microvax product line now includes the Microvax II low-end BA23s, the new models filling in the middle and the Microvax 3500 and 3600 at the high end (see chart).

The 3300 and 3400 reportedly offer 2½ to three times the performance of a Microvax II. The high-end 3500 and 3600 models offer slightly more than three times the performance of the Microvax II. A typical price for a 3400 is $53,950, while a 3300 will have a price of $40,950.

The products are distinguished primarily by expansion slots and the amount of storage each will accommodate. For example, the 3400 has 12 Q-bus slots, while the 3300 has half as many.

The rollout also ushered in DEC's new low-end storage technology that is expected to become available for other Microvaxes in the future. The RF30 Integrated Storage Element (ISE) is a single unit containing both a controller and disk drive.

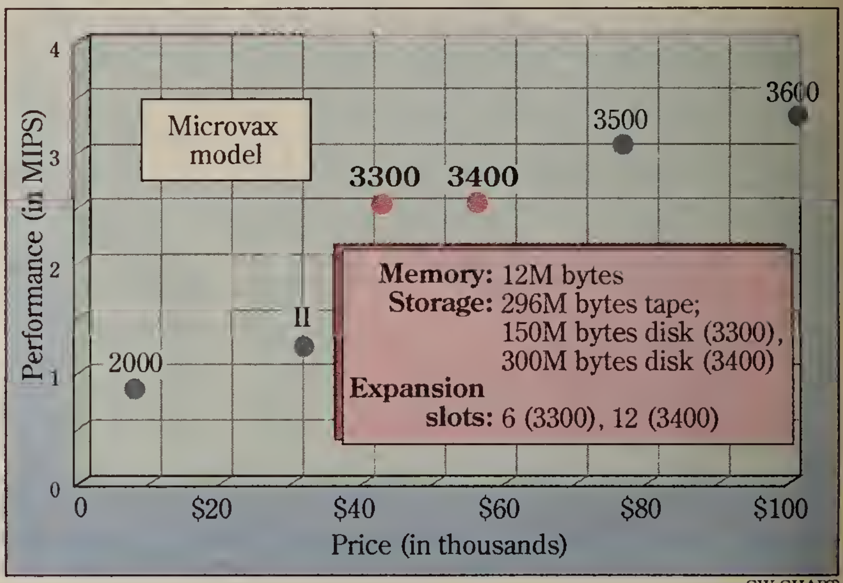
That architecture allows a user to boost data access speeds as well as capacity because a single controller is no longer responsible for several disk drives, according to Jesse Lipcon, a corporate consulting engineer at DEC who is responsible for the Microvax product line.

"The ISE is the real sleeper here," said Chuck Casale, president of the Aberdeen Group in Boston. "It will be tough for anyone other than IBM to rival that technology."

DEC plans to offer the 3300 and 3400 and a general business system as a server and as a real-time computer for a manufacturing environment. The server models will have an average price of $25,630, while the real-time model will typically cost $12,430.

Facing the VAX

The newest members of DEC's VAX 3000 family differ mostly in their storage options and expansion slots



CW CHART

Sun's up, but DEC earnings head down

BY NELL MARGOLIS
CW STAFF

Sun Microsystems, Inc. rose higher, Digital Equipment Corp. fell further and Convex Computer Corp. continued to stand tall in an otherwise brutal minisupercomputer market as third-quarter earnings reports continued to pour in late last week.

DEC's earnings plummeted more than 17% to $223 million for the first quarter, compared with the same quarter a year ago, partly because of heavy research and development investment incurred in mounting a workstation challenge to Sun.

DEC reported first-quarter revenue of $2.94 billion, a 16% rise from last year's comparable period. Sales of low-end and mid-range systems were strong, particularly the recently announced VAX 6200 series, according to DEC. The quarter's shipment of 12,000 workstations, added to last year's tally of 30,000 "puts Digital in the No. 2 position in the workstation market," said Domenic LaCava, vice-president of low-end systems.

High-end sales, however — including that of the VAX 8800 graphics workstation and the recently released on-line transaction processing system — lagged below expectation, damaging the overall profit picture.

In spite of chips

Despite headaches and backlogs brought on by the ongoing memory chip shortage, Sun reported revenue of $388 million for its first quarter ended Sept. 30, up 103% from last year's comparable period. Profits at the Mountain View, Calif.-based workstation company were up 60% to $20.6 million.

According to Sun Chief Executive Officer Scott McNealy, the continued shortage of dynamic random-access memory chips kept Sun from realizing even higher revenue and left it with "the highest quarter-end backlog in [its] history."

Sun refused to say exactly how big the backlog is, but McNealy said that expenses are being carefully tagged to expectations that the shortage could continue to curb Sun's revenue growth, at least through the end of this year. Recently announced across-the-board price increases ranging from 6% to 14% should aid Sun in its search for available and affordable DRAMs if the shortage continues, a company spokesman added.

In other earnings news, the crowded and competitive minisupercomputer market became a battlefield during the past quarter, and last week the front line reflected on the bottom line. Alliant Computer Systems Corp. announced a third-quarter $1.1 million net loss, compared with $438,000 in profits for the third quarter of 1987. Revenue dropped as well, falling 13% to $16.4 million.

Convex, referred to by several analysts as the sole strong survivor in the recent round of minisuper warfare, announced that sales were up 50% and profits rose 54%.

AT&T heads new Unix group

BY AMY CORTESE
CW STAFF

Seventeen vendors and AT&T, code-named the Archer group, let loose their first volley Tuesday with a double-edged announcement endorsing AT&T's Unix System V, Release 4 and forming a group that will guide AT&T on its development.

Despite apparent gathering support for AT&T, the group left plenty of room for negotiations with the Open Software Foundation (OSF) Archer and the OSF met last week and agreed to continue talks, although no discernable progress has been made.

The Archer group, which includes Sun Microsystems, Inc., Unisys Corp., NCR Corp., Control Data Corp., Prime Computer, Inc., Motorola, Inc., Fujitsu America, Inc., Toshiba America, Inc. and Amdahl Corp., backs System V, Release 4 because it merges the major Unix variants and protects the investments of the group's customers.

"We've been hopeful OSF would embrace System V, " said Fred Meir, vice-president of corporate program management at Unisys. The firm also wants the OSF to give assurances that it can both continue development of Unix and provide upward compatibility in future releases for current Unix users.

Unisys has concluded that the OSF cannot provide that, Meir said. A proposal is on the table for the OSF to subcontract development to AT&T.

The OSF responded that IBM's AIX will remain its core operating system but added the ambiguous statement, "We are working with AIX technology under a master license and hope to do the same with AT&T's System V, Release 4."

IBM influence

Some users questioned whether IBM was gaining too much influence over the OSF. Other OSF members "must have taken a deep breath before they committed to AIX. IBM will have a lot of clout in determining the shape and outcome of the OSF product," said Gary Handler, vice-president of Market Decision Systems at Shearson-Lehman Hutton, Inc.

Hugh Lynch, vice-president of general-purpose systems at NCR, said OSF members themselves do not know how much of AIX they want. He said that a number of OSF members need System V for continuity.

Gary McCormack, a spokesman for the OSF, cast more doubt on the commitment to AIX by indicating it was possible that if one line of AIX code were used, the rest might come from Unix System V but that the licensing agreements have to be worked out.

Other group members are Gould, Inc., Informix Software, Inc., Lachman Associates and Micro Focus, Inc.

Sun blasts OSF

Sun will not join the OSF despite months of speculation that it would, Sun Chairman and Chief Executive Officer Scott McNealy said last week.

After several months of uncharacteristic reticence, McNealy blasted the OSF, saying that the world does not need another Unix "variant."

"Sun isn't interested in supporting a variant of Unix," he maintained. "There is no reason not to stick with our strategy."

Certain members of the OSF — a group led by IBM, Digital Equipment Corp. and Hewlett-Packard Co. — are attempting to create confusion among end users, McNealy contended. "It's foolish that this kind of confusion exists," he said. "There have always been Unix variants. Now they'll have to choose between two, System V or OSF's, whereas in the past they've had to choose between many."

McNealy's statements effectively end a short courtship between the OSF and Sun. McNealy and Robert Kavner, president of AT&T's Data Systems Group, attended recent meetings held by the OSF, and Kavner was taking part in discussions with OSF leaders.

Two weeks ago, a Sun spokesman said the company would wait for a decision from AT&T before deciding whether to join the OSF. Reportedly, AT&T had scheduled a press conference at that time to announce it was joining the OSF but canceled it at the last minute because of a dispute between AT&T and the OSF over the composition of the OSF's board, according to reports.

The relationship between AT&T and Sun has weathered some rough periods. "There's a sophomore slump you go through with every relationship," McNealy maintained. "Relationships are all rocky at times, but especially one as complex as this one."

JULIE PITTA

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TRANSPARENT

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IAM is a transparent alternative to VSAM KSDS files, which substantially reduces the impact of VSAM processing in your installation. There are no modifications to programs or JCL to use IAM files in place of VSAM.

SMF ANALYSIS

VSAM SIZE REPORT

```
                              ALLOC      TOTAL
DATA SET NAME                  TRKS      EXCPS
BIG.CLUSTER                   37155    2507803
  BIG.CLUSTER.DATA            37100    2105001
  BIG.CLUSTER.INDEX              55     402802
A.FILE.SMALLER                16540     679216
  A.FILE.SMALLER.DATA         16500     270501
  A.FILE.SMALLER.INDEX           40     408715
SMPE.TDFP223.CSI              12315    3880211
  SMPE.TDFP223.DATA           12300    3075021
  SMPE.TDFP223.INDEX             15     805190
```

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Northern Telecom hops into private switching

BY ELISABETH HORWITT
and PATRICIA KEEFE
CW STAFF

NEW YORK — Northern Telecom, Inc. will make its debut tomorrow in the private switching market by announcing its Meridian Data Networking System (MDNS). It reportedly will interconnect a wide range of local- and wide-area networking environments, along with IBM hosts.

Northern Telecom described MDNS as an intelligent, open network architecture that will connect LANs and WANs, while supporting both voice and data communications.

Eventually, the company said, MDNS will provide "any-to-any" connectivity through support of the Open Systems Interconnect model and Integrated Services Digital Network standards. The product will also include voice and data network management.

"They have combined a basic PBX [private branch exchange] approach with a front-end processor into a standardized hardware platform that allows you to swap out different component boards to handle different communications links," said Clare Fleig, research director at International Technology Group in Los Altos, Calif. The 18-module system "looks real ambitious," she said.

The product will incorporate Northern Telecom's existing DV1 platform, a company spokesman said. MDNS will also combine an internal bus architecture with multiple, Motorola, Inc. 68000-based communications processors to interconnect a wide range of LAN and WAN environments.

TCP/IP connection

On the LAN side, MDNS will connect 802.3 Ethernet and 802.5 Token-Ring as well as Transmission Control Protocol/Internet Protocol (TCP/IP). The connection will be made via the Lanlink unit, which reportedly supports up to 24 connections over twisted-pair wiring, each handling 2.56M bit/sec. rates.

The box will also support PBXs, T1 multiplexers and front-end processors, the vendor said. On the wide-area side, it is said to support CCITT's X.25 and up to 16 T1 links per node.

The MDNS Node will provide in-depth support of IBM's Systems Network Architecture (SNA), the backgrounder indicated. It can connect to an IBM front-end processor or act like a front-end processor with a direct link to the host channel, the vendor said.

As an IBM System Services Control Point, the system reportedly can support up to 32 IBM cluster controllers, providing attached devices with access to SNA applications on multiple IBM hosts.

It will also connect IBM hosts to TCP/IP, asynchronous and X.25 networking environments. The device will also support IBM's Netview, sources said. While the backgrounder makes no mention of Netview, the system is said to provide management of IBM cluster controllers and terminals, as well as Northern Telecom SL1 and Sl100 PBXs.

Impressive as all this sounds, the initial release of the MDNS Node will be little more than an X.25 concentrator, according to Frank Dzubeck, president of Communications Network Architects, Inc. For example, while Northern Telecom promises "multiple LAN interfaces," it only mentions Lanstar support, with futures to come later, Dzubeck said.

Pricing was also unavailable at press time. A potential drawback of Northern Telecom's product is that a pricing strategy per module will mean that each niche player will be cheaper. "It's not cost-effective unless you want multiple modules," Dzubeck said.

The MDNS Node will compete directly with DEC's PC LAN Server and AT&T's Information Services Network switch, according to Dzubeck.

Laptops take off

Enhanced abilities may soon rival desktops'

BY WILLIAM BRANDEL
CW STAFF

If the market signals are correct, the business executive's office of the future will weigh approximately 11 pounds, resemble a briefcase, cost $4,000 and be portable to wherever business calls.

The market is taking off for the laptop computer — a highly functional machine that can now store most office programs and files in a box no larger than a Webster's Dictionary.

This trend has been marked most notably by the recent barrage of portable laptop announcements. Currently, customers' demand is outstripping supply. Meanwhile, companies such as Compaq Computer Corp., Mitsubishi Corp. and Toshiba America, Inc. have announced products that they cannot yet ship because of shortages in vital laptop components such as screens and certain memory chips.

IBM lags

According to Infocorp, a market research firm based in Santa Clara, Calif., laptop computers represent about 8% to 10% of the personal computer market in the U.S. today.

The group estimates that by 1992, 3.7 million of these machines will be purchased annually, or 22% of the PC market. IBM has thus far made only a token impression on the portable market with only a 4% market share.

"Laptops are already a threat to the desktop PCs today," said Abby Lawrence, an Infocorp microcomputer research analyst. "Not everybody needs a PC to take up half of their desk top. Eventually, all the functionality of a desktop PC will be loaded into the portables."

Huge growth seen

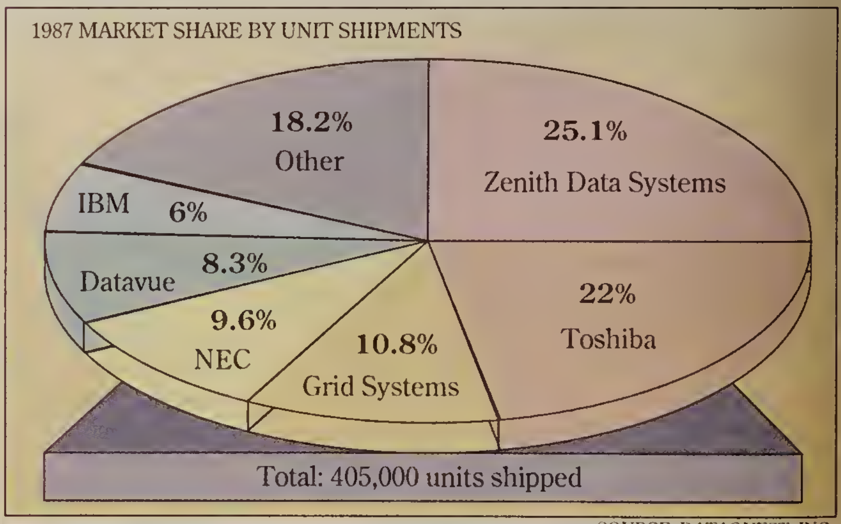
By the end of 1988, the laptop market will be worth $2 billion, representing 640,000 units shipped, said Bruce Stephen, a senior PC analyst at Framingham, Mass.-based International Data Corp. (IDC). IDC estimates that laptop shipments will grow 55% per year through that period.

Stephen attributed the laptop explosion to its enhanced dependability, functionality and value relative to desktop models.

Toshiba and Zenith Data Systems Corp. are the leading laptop vendors in the U.S., holding 22% and 25.1% market shares, respectively (see chart).

Lapping up the market share

Compaq's entry is expected to shake up the laptop picture



SOURCE: DATAQUEST, INC.
CW CHART

DEC

FROM PAGE 1

page 132), DEC will take the lead role in marketing and supporting Dbase for the VAX, with Ashton-Tate providing backup support and sales assistance. One boost for DEC could be Dbase's ability to serve as a front end for RDB, the strategic but much maligned DEC database management system bundled with most VAXs.

No time frames for delivery are expected to be revealed at the press conference today in Boston.

For Ashton-Tate, Dbase on VAXs would help fulfill a long-felt need to become a player in large-systems software. Two years ago, the company stated publicly that it was looking to acquire a large-systems DBMS supplier such as Relational, but no deal was ever made.

DEC's strategy now is to port Dbase itself to several more capable environments, including OS/2, AT&T's Open Look, Unix and DEC's VMS.

Same source code

According to a white paper released by Ashton-Tate at its users' conference early this month, both the Unix and VMS versions of Dbase will be "100% compatible across operating system platforms." That means, according to one source, that the source code of current Dbase applications will run unchanged on DEC machines. Like Lotus Development Corp.'s unshipped 1-2-3 Release 3.0, Dbase IV is written in C for easy portability.

Dbase will operate in two fashions on VAXs. In one mode, the software will be truly multiuser, allowing terminal users to access Dbase. The interface will center around the Control Center, a set of menus pioneered by Dbase IV, which is set to ship later this month.

Ashton-Tate also disclosed plans to release a single-user-oriented version of Dbase for 32-bit workstations that run under DEC Windows. This product will take full advantage of the DEC Windows graphical user interface.

Despite Ashton-Tate's ambitions, VAX users contacted last week could muster little excitement about the announcement. Unlike at IBM minicomputer sites, which often have a flock of micros running Dbase, VAXs are often found in academic, engineering and scientific settings — areas in which Dbase has less of a foothold.

The University of Toronto has little need for DBMS software and currently uses no third-party DBMS products, according to Ruth Milner, the university's systems manager. In fact, Milner's need for VAXs themselves is vanishing. "We are moving toward Unix and now have a number of Suns," she said.

For others, the broad range of VAX DBMS offerings locks Dbase out. "We are pretty heavily into a 4GL," explained Logan Ragan, manager of computer services at Bridge Brand Food Services Ltd. in Calgary, Alta.

DEC to add LAN server

DEC is expected to announce today a tough charge at the burgeoning local-area network server marketplace with an $18,800 PC LAN 2000.

The product, set for immediate availability, is a hardware/software system running DEC's VMS operating system and based on the guts of the Microvax 2000. VAX/VMS Services for Microsoft Corp.'s MS-DOS comes bundled, DEC confirmed.

The system includes 4M bytes of random-access memory and a 159M-byte hard disk with tape backup and will support a combination of as many as 29 IBM Personal Computers and Apple Computer, Inc. Macintosh computers, DEC confirmed.

With a huge installed base of VAXs, a server with VMS compatibility may have appeal. But while this DEC system is in line with the price of servers from other vendors, it may be a little late, said Frank Dzubeck, president of the consulting firm Communications Network Architects, Inc.

Dzubeck said his clients will opt for more conventional Intel Corp. 80386-based boxes running Microsoft's LAN Manager or IBM's LAN Server. "It is still a closed box," said one analyst, adding that the only breakthrough is Mac support.

DOUGLAS BARNEY

ORACLE World Records

MVS	265 tps
UNIX	124 tps
VAX VMS	49 tps

On July 18th, 1988, ORACLE made history by setting performance records in every major computing environment. Using industry standard benchmarks, ORACLE set speed records on IBM compatible mainframes running MVS, DEC VAX minicomputers running VMS, and minicomputers running UNIX.

ORACLE set the world record for performance by running 265 transactions per second (tps) on a 3090-600E class Amdahl* mainframe running the IBM MVS operating system. This breaks the old record of 240 tps set by a cluster of 16 Tandem computers.

ORACLE also set the record for DEC minicomputers by running 49 tps on a VAX 6240 running VMS. This breaks the previous VAX/VMS record of 29 tps set on a VAX 8700 connected to a VAX 8800. ORACLE's results were audited and verified by the Codd and Date Consulting Group. And not only is ORACLE's performance nearly twice as fast as this previous record, but ORACLE's cost per transaction is almost four times better than that of the other system.

ORACLE set a UNIX record of 124 tps on a large minicomputer from Sequent as well. Once again, the results were independently verified by the Codd and Date Consulting Group.

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	Philadelphia	Oct 26, Nov 18
	Pittsburgh	Oct 26
	Valley Forge	Nov 10, Dec 13
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	Columbia	Nov 16
	Greenville	Oct 19
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	Nashville	Nov 9
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	Dallas	Oct 4, Nov 15, Dec 8
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	Midland	Oct 19
	San Antonio	Oct 21, Dec 2
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COMPUTERWORLD

IBM mail meets Wang, DEC

Conversion tool has corporations' diverse systems talking

BY PATRICIA KEEFE
CW STAFF

RYE BROOK, N.Y. — IBM electronic mail users can now shake hands with messaging systems from Wang Laboratories, Inc. and Digital Equipment Corp., thanks to conversion software released last week by IBM.

Co-developed with Aratek International, Inc. in Toronto, IBM's Office Interconnect Facility (OIF) is a collection of programs designed to manage E-mail and revisable document exchange across a multivendor environment consisting of specific IBM, Wang and DEC equipment.

"By all measures, this has long been a demand from [our] user community," said Richard Abineri, IBM's director of applications systems management. "This is mainly a large enterprises kind of requirement, [and these] tend to have multiple mail systems installed."

The software will coexist with the CCITT X.400 products outlined by IBM last month [CW, Sept. 26], according to Abineri. "They can exist in the same gateway facility," he said.

He noted that while the X.400 products are geared toward the future, the OIF mail products will have a more significant impact on the way people are doing business today.

Users in all three environments require a portion of the OIF software. But they will not have to learn new commands or mail formats, nor will they have to cope with unfamiliar menus, Abineri claimed. Conference messaging across all three systems is also supported.

Users may be able to talk to each other, but IBM's Netview network management software draws the line at the firm's Systems Network Architecture activities and will not monitor the OIF action on the Wang and DEC systems, he said. However, the OIF software does provide some tutorial and administrative capabilities.

The OIF software is divided into three environments. There are two IBM systems packages: OIF/VM, available to users through IBM's Professional Office Systems, and OIF/MVS, which is accessible through either IBM's Personal Services/CICS or any other office system connected to IBM's Distributed Office Support System.

Prices, dates

Initial OIF/VM shipments are scheduled to begin in December, with volume shipments slated for March 1989. OIF/MVS is slated to be generally available in July 1989. The graduated monthly license charge will range from $387 to $1,819. They will also be available for graduated basic one-time charges ranging from $8,940 to $75,590.

Software for the non-IBM environments includes four packages: OIF/D1 for DEC's VAX and three Wang systems packages — OIF/W1 for the OIS mail system, OIF/W2 for the VS mail system and OIF/W3 for VS Wang Office.

OIF/W1 and W2 enable OIS and VS users to send and receive messages, a capability that IBM said cannot be done without Wang Office.

The monthly license charge for non-IBM system products will range from $72 to $120. One-time charges range from $1,380 to $2,300.

> "THIS IS mainly a large enterprises kind of requirement, [and these] tend to have multiple mail systems installed."
>
> RICHARD ABINERI
> IBM

Lyons, latest IBM emigre, at Ashton-Tate

TORRANCE, Calif. — Ashton-Tate Corp. became the latest major microcomputer software developer to hire a key IBM executive in an effort to beef up its senior software management.

William Lyons, who had served as vice-president of software marketing for IBM's National Distribution Division, was named vice-president of Ashton-Tate's newly created personal computer applications division.

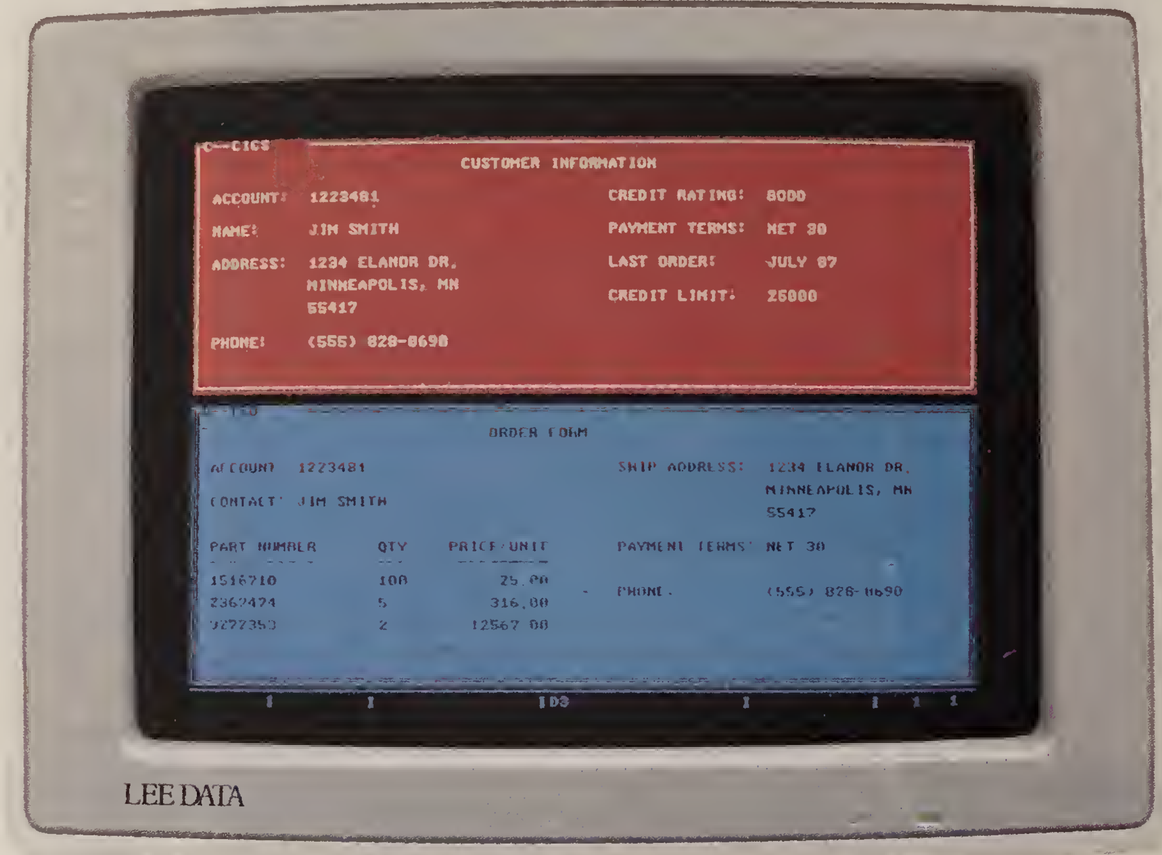
Lyons will be in charge of Ashton-Tate's Multimate word processing line, Draw Applause presentation graphics software and Framework decision support products. Although his title implies responsibility for all Ashton-Tate applications, Lyons will not work with the company's cornerstone Dbase product line.

Dbase and Ashton-Tate's Apple Computer, Inc. software development efforts are each carried out in separate operating divisions.

Lyons will oversee applications development, documentation, testing and management.

STEPHEN JONES

A display of brilliance.



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C--CICS
                         CUSTOMER INFORMATION
ACCOUNT:  1223481                    CREDIT RATING:  GOOD
NAME:     JIM SMITH                  PAYMENT TERMS:  NET 30
ADDRESS:  1234 ELANOR DR.            LAST ORDER:     JULY 87
          MINNEAPOLIS, MN            CREDIT LIMIT:   25000
          55417
PHONE:    (555) 828-0690

                           ORDER FORM
ACCOUNT   1223481                    SHIP ADDRESS:   1234 ELANOR DR.
                                                     MINNEAPOLIS, MN
CONTACT   JIM SMITH                                  55417
PART NUMBER        QTY     PRICE/UNIT    PAYMENT TERMS:  NET 30
-----------        ---     ----------
1516710            100          25.00    PHONE.          (555) 828-0690
2362474            5           316.00
9272353            2         12567.00
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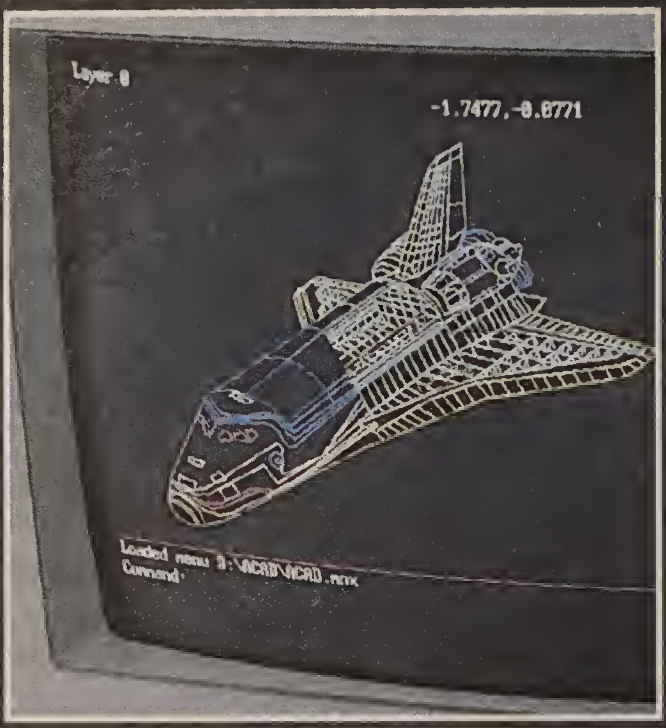

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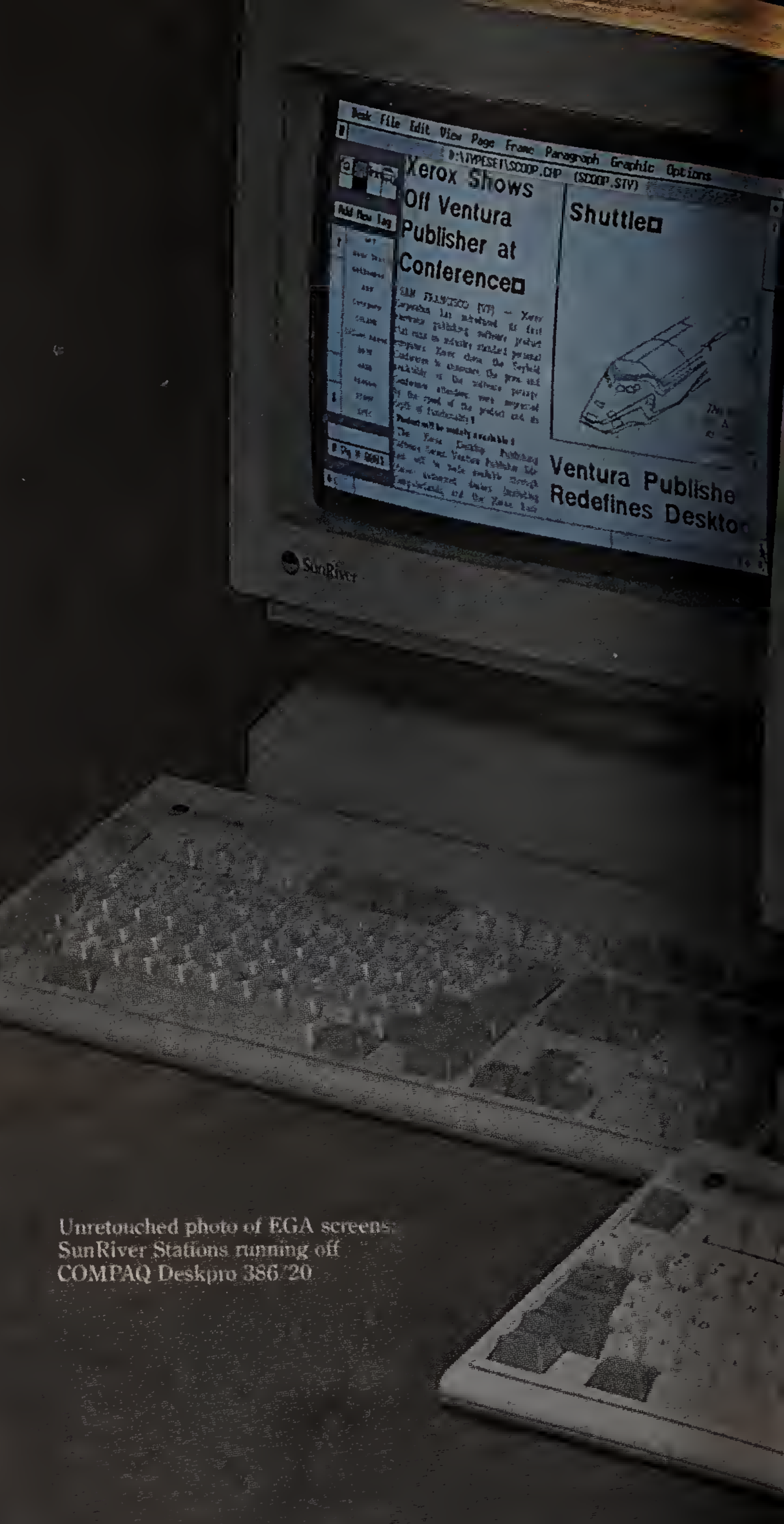

Unretouched photo of EGA screens: SunRiver Stations running off COMPAQ Deskpro 386/20

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Interlan bridging tool links Netware, OS/2 LAN Manager

BY PATRICIA KEEFE
CW STAFF

BOXBORO, Mass. — Interlan, Inc. last week announced bridging software said to provide transparent interoperability between workstations running Novell, Inc.'s network software and Microsoft Corp. OS/2 LAN Manager-based servers.

Scheduled to be available in the first quarter of 1989 for $895, Interlan's LMN Server has two obvious, and at times overlapping, audiences.

The first group is Novell Netware users — Microsoft MS-DOS or OS/2 clients — who want to migrate over to a LAN Manager-based OS/2 network. Novell said it will not license LAN Manager. It does plan to provide OS/2 connectivity and will support LAN Manager's Named Pipes application program interface under OS/2, not DOS.

> "I FEEL LAN Manager is making such a dent that Novell is getting shut out left and right."
>
> FRANK DZUBECK
> COMMUNICATIONS NETWORK ARCHITECTS

The second target is the current base of Interlan hardware users who run under Netware in an MS-DOS environment and want to migrate along with Interlan to OS/2.

Interlan said it will continue to support Netware under DOS but that it will focus its OS/2 connectivity development efforts on the LAN Manager.

A third market consists of MIS managers who are faced with a mix of disparate local-area networks and are looking to standardize on one platform.

Interlan's LMN Server approach will cost less than Transmission Control Protocol/Internet Protocol and will be easier to install, according to Clare Fleig, director of research at International Technology Group. This is important to a number of Fortune 1,000 firms, she noted.

But perhaps the most immediate beneficiary of Interlan's bridge software is Novell rival and LAN Manager co-developer 3Com Corp. The only LAN Manager-based server available today is 3Com's 3+Open. LMN Server could provide 3Com with access to Novell's installed base.

"It gives them a catching-up type of edge in the corporate environment, where they trail Novell," Fleig said.

"I feel LAN Manager is making such a dent that Novell is getting shut out left and right," said Frank Dzubeck, a consultant and president of Communications Network Architects, Inc.

"You've got this ground swell [of support] taking place," he said, citing Ashton-Tate Corp.'s recent decision to cancel a strategic alliance with Novell and the two influential mini makers who have endorsed LAN Manager — Digital Equipment Corp. and Hewlett-Packard Co. "It's big, bad news."

3Com's Alan Kessler, OS/2 product manager, said he is delighted. He outlined a scenario in which clients who wanted to move to LAN Manager could use Interlan's bridge to slowly move Netware-based data and applications over to 3+Open and start shutting off Netware servers.

Novell declined to comment until executives have had a chance to familiarize themselves with the product.

Dzubeck suggested Novell can use LMN Server as a weapon to neutralize some of the LAN Manager's growing clout. "Then you concentrate on [Netware's] speed and throughput performance," he said.

The LMN Server is a software-only package that runs as a LAN Manager application, for example, running over 3+Open, while reportedly preserving the customer's investment in existing LAN products. According to Interlan, it was designed to work with all OEM versions of LAN Manager.

The bridge enables an indirect log-in through another Netware server on the network. Netware users must log in to the Netware server, which then connects the user to the LMN Server. The client uses existing Netware applications in the SYS:Public server directory when accessing the LMN Server. A transient program called LMNSCopy allows an OS/2 LAN Manager workstation to transfer files directly from a Netware server to an LMN Server.

Users do not have to change their client software or command interface. LMN Server provides virtually the same set of command-line utilities as Netware as well as limited support for certain Netware menu utilities, Interlan said.

The LMN Server system requires a Netware-compatible adapter, which in turn requires a Media Access Controller driver that complies with the current version of the Microsoft and 3Com LAN Manager Network Driver Specification.

Early users express ISDN concerns

BY ELISABETH HORWITT
CW STAFF

BOSTON — Early ISDN systems provide some cost advantages and flexible networking options but are still plagued by limited product selection and intervendor incompatibility, several early users testified at a seminar held here last week.

The seminar, jointly sponsored by Codex Corp. and its parent company, Motorola, Inc., saw some down-to-earth discussion about the hazards and potential benefits of replacing existing telecommunications networks with the Integrated Services Digital Network (ISDN) standard. Common themes that corporate communications managers stressed included the following:

- ISDN equipment costs too much. ISDN terminal adapters currently cost between $300 and $1,500, a Codex spokesman said. Costs should come down when chip companies start shipping ISDN interfaces on chips in bulk, according to industry sources.
- ISDN links are not widely available yet. For example, Chevron Information Technology Co. would like to use ISDN to link point-of-sale terminals at service stations, "but for that, ISDN needs to be ubiquitous," Chevron spokesman Stephen White said. Right now, only one Bell operating company, Illinois Bell, has filed an ISDN tariff. AT&T's ISDN service is scheduled to serve 18 cities by the end of this year and about 70 by the end of 1989, a company spokeswoman said.
- "None of the different vendors' ISDN products that we have evaluated so far can talk to each other," said Jeff Fritz, a data communications manager at West Virginia University. According to Codex's Gail Smith, who chairs the American National Standards Institute standards committee that deals with ISDN connectivity, the basic specifications for ISDN are stable enough, but vendors have yet to implement them fully.
- The initial low cost of carriers' ISDN tariffs may not last once initial market demand has been generated. Rather than be at the mercy of possible price hikes in the future, Boeing Computer Services Co. decided to spend some $120 million on the equipment to implement its own private ISDN network, according to Boeing engineering manager Robert Furtaw.
- ISDN products do not provide full ISDN capabilities. For example, while ISDN links support 64K bit/sec. rates, some ISDN equipment only supports up to 19.2K bit/sec. — too slow for IBM Personal System/2s, for example, which can transmit at 115.2K bit/sec. or faster, Fritz said.
- ISDN-compatible networks are unable to handle data applications in a cost-effective manner. For example, to guarantee fast response time for students who want to access library files, West Virginia University would have to set aside certain ISDN lines as permanently available connections. This would be a costly solution, given that ISDN-line costs are use-sensitive and the students would only be using the lines "once every 30 or 40 minutes," Fritz said.

> DESPITE THE numerous complaints and reservations, users said ISDN is definitely saving them money and spoke eagerly of future strategic uses for the standard.

Despite the numerous complaints and reservations, users said ISDN is definitely saving them money and spoke eagerly of future strategic uses for the standard. ISDN will initially justify itself at Boeing, Furtaw said, by eliminating the $500 it costs every time an employee moves or changes a voice or data terminal. Boeing's average is 1.2 moves or changes per year for each of 120,000 employees. Now that the network is in use, users are coming up with their own applications for ISDN, Furtaw added.

West Virginia University is saving money through ISDN by giving some departments one digital line instead of three analog lines — "two for personal computers, one for a telephone," Fritz said. But what excites him most, he said, is what will happen when the basic network is in place in a year or two, "when we can find things to do with ISDN that you can't do via a regular telephone network."

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AT&T dedicates group to systems integration

BY ELISABETH HORWITT
CW STAFF

NEW YORK — AT&T last week turned up the heat in the burgeoning systems integration market by formally announcing its Systems Integration Division, which will focus on networking solutions.

AT&T should do well in this area, as long as it can get its organizational act together and "does not try to be all things to all people," according to Claire Fleig, director of systems research at International Technology Group (ITG) in Palo Alto, Calif.

The commercial systems integration market should grow from $397 million in 1987 to an estimated $4.49 billion in 1992, according to ITG.

Chuck Yates, vice-president of the Systems Integration Division, emphasized that AT&T would focus on certain key application areas in which it already has expertise and products. Initially, the vendor will target telemarketing as well as data networking applications such as electronic data interchange (EDI).

Existing services

AT&T already has a full line of telemarketing products and recently announced an EDI service that is slated to go on-line early next year.

AT&T has been performing systems integration for several years, Yates emphasized, both through its Federal Systems Group and through individual projects with large commercial customers.

Approximately three years ago, for example, the company designed an outbound call management system for American Express Travel Related Service Co.

Since AT&T had no such product at the time, it had to design software from scratch, and several of its product divisions cooperated for the first time on the project, according to Linda Schoneberger, a manager of systems development for the Amex subsidiary.

"We chose AT&T because they had a strong systems integration group, and they identified hardware components [that could do the job] if put together with the right software," she said.

AT&T is now working with the subsidiary to extend the telemarketing system through the vendor's Integrated Services Digital Network product offering.

The division, which AT&T announced last spring, has an initial staff of 200 to 300 employees with expertise in project management. They will draw on the products and personnel of other AT&T divisions, Yates said.

The division will also cooperate with other vendors and integrators in order to provide products and expertise that go beyond AT&T's resources, he added.

Value adder

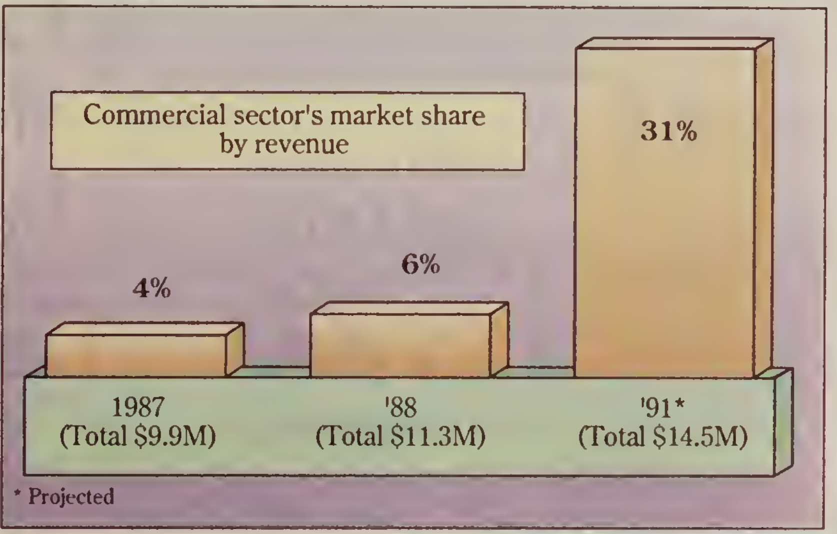
Providing systems integration has become a popular way for vendors to add value in the computer market, said Peter Bernstein, an analyst at Probe Research, Inc.

"But I think people will listen to AT&T when they say, 'We have this incredible multivendor network, we have gone through the same problems you are going through, and we can apply the same expertise,' " Bernstein added.

Other recent entries in the systems integration market include AT&T archrival Northern Telecom, Inc., software vendor Oracle Corp., Data General Corp., IBM, Digital Equipment Corp., Wang Laboratories, Inc. and several Bell operating companies.

Boarding the fast train

The commercial sector is expected to be the fastest growing among the systems integration market



SOURCE: INTERNATIONAL TECHNOLOGY GROUP
CW CHART

Data Design targets PCs

Software house aims to unburden mainframes

BY ROBERT MORAN
CW STAFF

SUNNYVALE, Calif. — Data Design Associates (DDA), the developer of financial management software for mainframes, last week announced that its applications now run on IBM Personal Computers and compatibles.

With the single-user systems, the company said, it is targeting large corporations that want to capitalize on the economical power of the PC to unburden the mainframe from such chores as applications prototyping; data entry and retrieval; report generation; and training.

The software offers all the functionality of its mainframe counterpart, said DDA Vice-President George Proudfoot. He claimed it takes a step beyond other mainframe software for the PC, which typically offers either subsets of the mainframe software or altogether distinct products.

That step, however, may not be enough. The new software's mainframe functionality offers an incremental improvement over PC-based offerings from the likes of Computer Associates International, Inc., Management Science America, Inc., McCormack & Dodge Corp. and Oracle Corp., but it has not leapfrogged that technology, said John Dunkle, vice-president of microcomputing research at the Aberdeen Group, a Boston consultancy.

Still missing is the capability to allow mainframe systems managers to poll the individual PCs for the data that the mainframe needs. Thus control over mainframe data would be in the hands of micro users, who have, but may not necessarily exercise, the ability to upload data to the mainframe. Such use runs counter to typical practices in mainframe shops.

Data Design offers five products — general ledger, accounts payable, purchasing, fixed asset accounting and project accounting — that can now run on the IBM Personal Systems/2 and Personal Computer AT under DOS. The software, written in Cobol that is compliant with ANSI '85 standards, will be delivered in the first quarter of 1989 and will cost between $10,000 and $15,000 each for customers that have the mainframe software. To run the software, the micros must at least be Intel Corp. 80286-based, carry 640K bytes of internal memory and have 1M byte of additional memory.

Adjunct

According to DDA's Proudfoot, the software is an adjunct to the company's mainframe software and should be viewed as an "extra-usage license." Corporations that do not have mainframe licenses can purchase the micro-based software but will pay almost as much as mainframe prices, Proudfoot said.

In the next few months, the company will add data communications and local-area network support to its offerings — a step toward cooperative processing, Proudfoot said. With the next announcement, DDA will also offer users the ability to upload and download portions of files to and from the mainframe.

The software offers the same on-line screen formats and processing rules, input transaction and master file formats, and security options as the mainframe software packages, but still missing from the menu is network management support.

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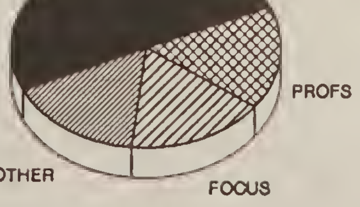

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Vote-tallying reforms urged

Federal study warns of potential problems

BY MITCH BETTS
CW STAFF

GAITHERSBURG, Md. — Administrators of local elections need to make major improvements in computer security and procedures to restore public confidence in computerized vote-tallying, according to a federal study.

"Many technically trained people have real concerns about the way votes are tallied," said Roy G. Saltman, a computer scientist at the National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards.

For example, Saltman's report urges administrators never to allow special vote-tallying software to run on systems with other software because of the risk of contamination by Trojan horses or viruses.

Whoops

The NIST study cited several elections in which computerized voting records were faulty. In one case, a Carroll County, Md., election in 1984 was off by 13,000 votes because the wrong utility program was used for reading punch-card ballots, the NIST said.

In essence, the same internal controls that businesses — especially banks — apply to counting money should be applied to the process of counting votes, Saltman commented.

Approximately 55% of all U.S. voters use some form of computerized vote-tallying equipment.

Fraud potential

The biggest problems are that inadequate audit trails make it difficult to verify election results and poor internal controls invite the possibility of undetected frauds, the report indicated.

The NIST study includes the following recommendations:

> IN ONE CASE, a 1984 election was off by 13,000 votes because the wrong utility program was used for reading punch-card ballots.

- Administrators should add personnel with expertise in internal controls, security and auditing, so they do not have to rely on outside technical assistance or vendors.
- States should adopt the vote-counting hardware and software performance standards that are forthcoming from the National Clearinghouse on Election Administration.
- Audit trails, access controls and thorough pre-election testing should be mandatory in vote-tallying systems. Also, the logical design of the software should be tested and certified.
- The use of prescored punch-card ballots should be eliminated. The punch-outs, which are called "chads," may fall out or may not be fully removed, which would prevent the vote from being accurately recorded.

Saltman also recommended that states consider adopting, at minimum, the Texas statute on electronic voting systems, which incorporates several of the study's recommendations.

Ex-Gillette exec Moody hired at Bank of Boston

Kavin Moody, former top information systems executive at Gillette Co., has resurfaced as a key executive at the Bank of Boston.

Moody, who left his post as corporate director for MIS at Gillette in June, was recently hired by Bank of Boston's director of corporate information and technology, John H. Rogers. Moody's new title is director of systems management, although he said his duties have not been precisely defined.

"It will be on the application side, involving the management process. The broad charter is the systems development process," Moody said.

Summer vacation

Moody added that he spent the summer studying and researching opportunities for his own information systems business. After deciding not to move forward immediately with that venture — generally described as an information processing service for the travel industry — Moody said he discussed a consulting role with Rogers. Moody said Rogers then invited him to join the bank and share some of Rogers' responsibilities.

"There's enough change going on in this industry that there is plenty to do here," Moody added.

Moody left Gillette after the company fought off repeated takeover attempts, restructuring and cutbacks in corporate spending, including MIS expenditures (see story page 100).

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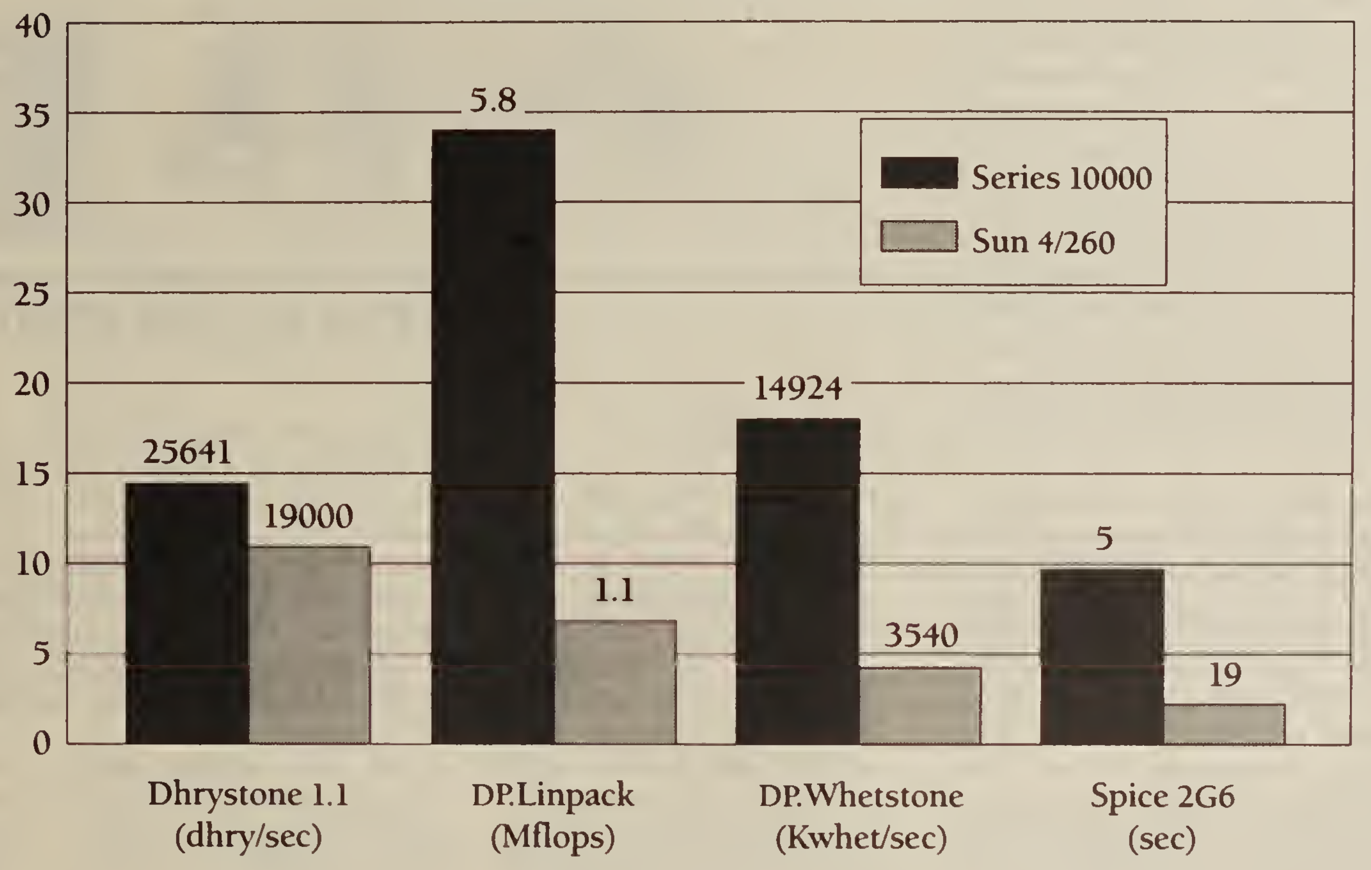

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EDITORIAL

Where was Dan?

IT'S BEEN NEARLY two years since the stark realities of Section 1706 became widely apparent, kicking off one of the most divisive and continuing struggles the computer industry has faced in years.

With the potential of changing the employment status of thousands of data processing consultants working through brokers, 1706 has been the object of ardent attacks by the consultant community while being ardently promoted by technical service companies, led by ADAPSO.

Yet despite many months of haggling, proposed amendments, proposed counter-amendments and the like, it wasn't until earlier this month that both sides of the complex issue sat at the same table to discuss and debate 1706.

On one side at the recent Info '88 conference sat Joel Brust, founder of a technical service company and ADAPSO's point man on 1706. Opposing him was Joe Scordato, an independent consultant and past president of the 7,000-member Independent Computer Consultants Association.

As important as who was there is who *wasn't* — and that was a representative from the office of Sen. Daniel P. Moynihan (D-N.Y.). You see, it was Moynihan's office that slipped 1706 into the Tax Reform Act in the wee hours of a June 1986 budget session. It was Moynihan's office that first staunchly defended 1706 but later tactfully (but unsuccessfully) tried to repeal it.

So *Computerworld's* editor, who moderated the Info '88 panel, logically assumed that the creators of 1706 would certainly oblige a request to appear on the panel to explain the genesis and intent of the legislation and to shed some light on Moynihan's 180-degree reversal of direction.

But the response of Moynihan's chief advisor on 1706 to our request was simple and straightforward: "I wouldn't go before that group and take any more of their abuse for all the money in the world." Instead, the aide promised a written position statement to be read at the panel discussion. It must have gotten lost in the mail.

Bear in mind that 1706 was put into place without the benefit of a single hearing featuring both sides of the issue. While it is true that many bills are handled this way, those that have the potential to affect so many people on both sides of an issue certainly deserve a public airing. There finally was one at Info '88, and the politicians stayed home. Both factions deserve better.

At present, 1706 stands pretty much in its original form. During the next year, the Treasury Department will undertake a 1706 impact study under the direction of Congress, and all interested parties should make sure their input is registered. Eventually, public hearings should be mandated.

And while you're at it, drop Sen. Moynihan a line and let him know how you feel about the candor of his office in this important matter. His address in Washington is 464 Russell Building, Washington, D.C. 20510. You'd be amazed what a few thousand letters can do.

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LETTERS TO THE EDITOR

In person

Your article, "The training that talks back" [CW, Aug. 15], says "interactive video is widely viewed as more effective than other media-based training."

In fact, interactive video is often more liked by learners, but its effectiveness is really no better when measured in terms of acquired learning and retention.

The article also states that interactive video instruction (IVI) is generally more costly. I'll say! Just compare custom-developed computer-based training, given at $6,000 to $20,000 per hour, with IVI, at a cost of $120,000 to $300,000 per hour.

Rockley Miller's statement in the article, "Live instruction can be superior if you have the best instructor and a tightly organized course," is like saying, "Florida is great in the summer if it isn't too hot or too humid." Let's look at how it is most of the time.

Classroom instruction is by far the easiest to revise of all the delivery media. Certainly, word processor-based computer-based training is the next easiest to revise.

Travis Piper
President
Creative Approaches, Inc.
E. Bloomfield, N.Y.

Just who wins?

The article, "Tax changes rejected; one-year setback seen" [CW, Sept. 12], could have just as easily been headlined "ADAPSO wins again; independent contractors now an endangered species nearing extinction." Where did Congress' Joint Committee on Taxation get the estimate of a $500 million revenue loss over five years?

Here is my experience with 1706. Last year, I signed a W-4. Due to lower income, my tax return for 1987 showed an 80% reduction from the taxes I formerly paid using all those pre-1706 deductions. This year could show a 90% reduction from my former tax bill. Tell that to the Joint Committee on Taxation!

Are there thousands like me who collectively are paying millions of dollars less in taxes because of 1706? If so, I would appreciate it if one of those elected representatives on the Tax Committee could explain how the repeal of 1706 is going to cost money.

Phil Nowak
Chicago

High security

This letter is about job security, which I think was missed in your annual job survey [CW, Sept. 5 and 12]. Even though you talked about what salaries were good in which industries and job satisfaction, which is important, so is job security, which I think is sadly lacking in private industry today.

I worked for a medical manufacturing firm for four years, and in that time, I did well with the company. But the company ran into legal and financial problems.

Its solution was to sell part of the company and start cutting back on personnel and freezing pay raises. They cut whole shifts at a time and laid off hundreds of employees.

I opted to seek other employment and found a job with a community college. I have found in the short six months of being here that, although the government may pay less than private industry, there is — among other tangible and intangible benefits — the fact that being employed here for a small amount of time means you are pretty much secure in your job.

Unless you commit a major problem, you will not lose your job. And you do not have to worry about coming in and being told you no longer have a job, because the government will never go out of business. Until private industry as a whole cleans up its act, I will continue to seek employment only with the government.

Steve Schafir
Information Systems Specialist
Miami-Dade
Community College
Miami

A step ahead

I take exception to the article stating that Amdahl Corp. was the first plug-compatible manufacturer to announce ESA/370 support [CW, Sept. 19]. National Advanced Systems announced support for this evolutionary extension of 370/XA in June 1988, one full quarter ahead of Amdahl.

NAS has always responded in a timely manner to evolving 370 architecture and to announcements in the compatible market. Support for ESA/370 and functional equivalence for PR/SM reaffirm our leadership in the compatibility arena.

J. Denis Lambert
Systems Engineering Manager
National Accounts Region
National Advanced Systems
San Francisco

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Publishing and perishing

ROBERT HARGROVE

Perhaps you've seen the articles and advertisements on desktop publishing.

It's that combination of software and laser printers that will save you a bundle of money on your printing needs as cost-effective manuals, newsletters and brochures flourish throughout your organization. Desktop publishing promises a new age of creativity.

Piece of cake

I recently tried my hand in this field, convinced by a friend that it was one that I could master in little time. After all, it's just another computer program, right? Something like a word processing package in a tuxedo.

Imagine my surprise when one of my first decisions was whether to pick inches or picas as my standard of measurement. Picas? Isn't that some kind of fish?

Then I faced using "em" and "en" spaces, points, kerning, leading, fonts and all the other typographical terms with which I was only familiar through seeing them in print.

I also learned, much to my disappointment, that I am not a born graphics artist. In fact, my first publication could have been subtitled "Fonts of the Universe," as it appeared, ah, a tad busy.

This revelation brought home to me the thought that while the results of desktop publishing can be quite satisfying and cost-effective, there is quite a learning curve.

And just because it's a computer application does not necessarily mean it belongs under MIS' domain. Graphic arts and a knowledge of typography are vital in taking full advantage of the application.

And if you don't have this knowledge? Try to imagine desktop carpentry practiced by someone unfamiliar with hammers, nails or saws and who is not really sure what a table should look like.

Even if he knows what a table is, he still would not be able to tell a Louis XIV table from a poker table. There is some hope, of course, and that is to have the creative work performed by experts.

If you have some general ideas on what you wish to use desktop publishing for, hire a consultant — preferably a graphics artist — to help you design templates.

Then, when you are ready to compose your newsletter or manual, call up a template and create your document without being held back by a lack of aesthetic talents.

Make the process modular by letting the experts do what they do best and then using their design within your environment.

PAUL MEISEL

At a publishing seminar I recently attended, the instructor stated that in 1987, nearly one half of all desktop publishing ventures within companies failed for the following reasons:

- Management's failure to understand the application ("We bought it, plugged it in and we still don't have any documents").
- Management's failure to properly train those who will be using it.
- Management's failure to manage expectations — that is, not preparing people for the fact that there is a steep learning curve and that professional looking documents won't appear overnight.

Indeed, these reasons for failure may well apply to any new application.

Failure to identify the real strengths and weaknesses of desktop publishing could put one in an untenable situation — that is, of course, publishing and perishing.

Hargrove is security and contingency planner at the University of Texas's Health Science Center at Houston.

How a UPS prevents a corporate heart attack

KENNETH BRILL

"Which kind of uninterruptible power supply should I select — rotary or static, brand X or brand Y? And whose UPS should I buy? There are so many choices, and the vendors make diametrically opposing claims. A lot of money — and perhaps my career — is at stake."

Every senior-level MIS manager will at some point confront this choice, and a lot is at risk. I believe that relative to advertised performance claims of providing UPS, all the UPS technologies and all the UPS vendors fall short — sometimes dramatically.

Out of stock

What you as a user should demand is uninterrupted, continuous, clean power in the computer room, at the input terminals of your computer hardware and in communication systems. But that is not what the vendors are selling and, in fact, not what they are providing.

The solutions vendors offer are only pieces of what you really need.

The hardware of a UPS system consists of the power supply, which is what most vendors are selling, along with other critical components.

It is of no value to spend a lot of money on one subsystem if the weakest link governing real performance is somewhere else.

It is even worse to focus on which hardware to buy if actual performance depends on the reliability of the fundamental design and how the equipment is installed.

Once installed, the system must, of course, be maintained, repaired, tested and certified as emergency-ready.

So, coming back to the question — "Which UPS should I buy?" — the fundamental problem is not what to buy but how to think managerially about solving the uptime problem.

We have been conditioned to think that buying technology is the riskless way to achieve what we want and that the only problem, therefore, is picking the right vendor.

This approach might work in some areas, but it could result in disappointment — and perhaps disaster — if applied to the physical plant.

Years ago, a similar management problem existed in selecting computer hardware. Sales pitches were made emotionally. Having the latest in technology was the most important issue.

Over time, users began to realize that what really counted was availability and how much processing power the hardware could actually deliver.

As a result of constant attention, hardware uptime grew from a low 80% range to a near 100% perfection today. This revolution began when users started to monitor performance and hold manufacturers accountable.

What people quickly found is that the simplest and dumbest things could cause downtime, and not all of these were the manufacturer's fault. Systems engineering and reliability of each component of the computer system became paramount.

As manufacturers learned what users really wanted, they quickly went about filling that demand to create a competitive edge.

Top management has to change the way it thinks about its investment in the physical facilities supporting computer operations. The cost of this "site" — the UPS investment, the cooling, generators, fire protection and so on — runs between 7% and 15% of computer and communications hardware investments.

For large sites, the initial building cost can run to many millions of dollars, and the annual operating costs may reach the high-six or low-seven figures.

If these costs were incurred for a direct-access storage device or a CPU, performance measurement and optimization would be a full-time job for a very senior manager. A site is no less critical, but most facilities do not get the same level of professional attention.

In view of current high hardware uptime performance, a modest improvement could be more cost-effective for some sites than adding processor redundancy.

There is a second reason for looking at facility uptime as a specific bottom-line objective. Disaster recovery planning has become a major market need in just a few years, yet many firms have only the bare rudiments of a workable plan.

MANAGERS WHO focus on systems uninterruptibility are much more likely to achieve their overall objectives than if they see the UPS issue as merely what brand to buy.

The very heart of disaster recovery planning is the objective of efficiently picking up the pieces after a corporate heart attack has already occurred. Recovery from a disaster involves the following:

- Substantial risk that something has been left out of the plan or that a critically needed tape might be missing or defective.
- A guaranteed computer outage with potential long-term business disaster consequences.
- Costly recovery expense.
- The certainty of organizational disruption for months afterwards.

If it is cost-effective or prudent to devise a disaster recovery plan, doesn't it also make sense to invest some resources in preventing a heart attack?

I estimate that nationally, fewer than 50 disaster recovery plans address disaster prevention or disaster avoidance. Yet in hindsight, we can see that more than 75% of the disasters forcing costly activation of a recovery plan could have been anticipated.

Simple steps can dramatically reduce your risk exposure. In fact, if you are working with limited funds, it would probably make more sense to treat disaster prevention as a first priority.

Uninterruptibility and disaster avoidance are opposite sides of the same coin. If you do one well, you have the other as a side benefit.

The bottom line

By focusing on bottom-line objectives of either uninterrupted facility uptime or uninterrupted power uptime, the whole problem-solving approach in building a new data center or selecting a UPS is positively changed.

Immediately, the question is transformed from how to buy an individual component to how to build a system that never fails. This approach also focuses attention on the initial installation and on the cumulative performance over a period of years, which brings training, maintenance and testing into the picture.

Managers who focus on systems uninterruptibility are much more likely to achieve their overall objectives than if they see the UPS issue as merely what brand to buy.

Brill is president of Computersite Engineering in Cambridge, Mass. He specializes in the field of disaster avoidance and site reliability.

Is it Safe?

North Africa...U.S. paratroopers on the way to their next mission. (Credit: International News Photos)

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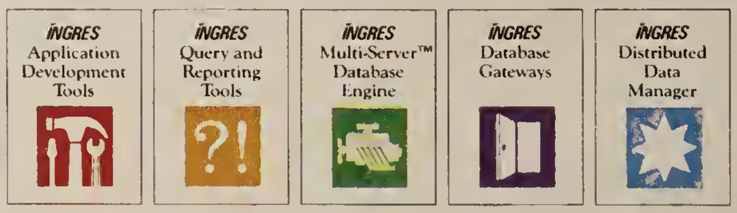
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SOFT
TALK

Stanley Gibson

Please, limit Enterprise

To boldly go where everyone has gone before. What do Captain Kirk's spaceship, an aircraft carrier, the first space shuttle and, by 1990, all computer systems and software have in common? All are or will be named Enterprise.

With the unanimity that makes one think they have read the same market research report, all vendors, one by one, are affixing the name Enterprise to their products.

IBM led the way by renaming its 370-architecture systems Enterprise Systems (ES). The most recent version of MVS is called Enterprise Systems Architecture (ESA). Several weeks ago, Cullinet named most of the products in its catalog Enterprise: systems.

Even a relatively obscure software firm, Cimlinc, Inc., introduced a product called Enterpriseware.

Now all some marketing hack has to do to achieve a great breakthrough in market differentiation is simply to choose some other name, no matter how bad. Let's see, how about Glugware, or Ergbase? Bad?

Continued on page 28

Unisys' 4GL hopes

Linc, Mapper underpinning Unisys effort

BY STANLEY GIBSON
CW STAFF

In February 1989, The Colonial Group, Inc. in Boston plans to go "live" with a $30 million software package that will have cost it only $1.5 million. The key: Unisys Corp.'s fourth-generation language (4GL), Linc.

The package is nearing completion under the guidance of Philip Pyburn, a former business school professor turned software developer. Colonial was in search of a large transaction processing application, the kind that Pyburn said normally costs mutual fund investment firms tens of millions of dollars. After much study, Pyburn, under contract to Colonial as a consultant, proposed that he and three associates construct the application using Unisys' Linc.

Pyburn said he has thus far generated more than one million lines of Cobol, several hundred applications and some 300

Continued on page 33

Data View

Minisupers put to good use

U.S. vendors' 1987 worldwide revenue for minisupercomputers by application

Application	Revenue (in millions)
Design engineering and analysis	$32.8
Scientific research and R&D	$27.8
Classified defense	$27.3
Biological and chemical engineering	$19.6
Simulation	$19.4
Geoscience and geo-engineering	$16.5
Design and drafting	$11.9
Imaging	$5.3
Animation	$4.1
Economic and financial modeling	$4.1
Software engineering and analysis	$3.4
Industrial process control	$0.7
Technical management and support	$0.5
Other	$21.8

SOURCE: INTERNATIONAL DATA CORP.
CW CHART

IBM seeking foothold in disaster recovery?

ANALYSIS

BY JAMES DALY
CW STAFF

Once again, IBM seems ready to drive down a road once others have paved it.

Before IBM introduced its Personal Computer in 1981, several companies spent years laying the foundation for the personal computer market. IBM's PC went on to become an industry standard; the rest became also-rans.

Similarly, Oracle Corp. and Relational Technology, Inc. devoted years of pioneering groundwork to the relational database market on minicomputers before IBM liked what it saw and launched what became the dominant mainframe systems, DB2 and SQL/DS.

IBM's latest target appears to be the disaster recovery business. Recent reports that IBM is floating the idea before its customers are no laughing matter for the vendors now earning their keep there.

But it makes perfect sense for the Armonk, N.Y.-based giant. "It would certainly fit in with IBM's stated game plan to increase their system integration and service business and would entail very little risk on their

Continued on page 29

Atom-smash machine run with DBMS

BY AMY CORTESE
CW STAFF

Oracle Corp.'s Oracle database management system is helping 13 European nations build and control the world's most powerful atom-smasher. Scientists are also using the software to analyze data captured in nuclear experiments.

The Organization for Nuclear Research, better known by its French acronym, CERN, is a consortium involved in nonmilitary nuclear research. CERN, located just south of Geneva, houses the world's most powerful atom-smasher, the Large Electron Positron Supercollider. The supercollider is still under construction but is already in partial use. To manage the data collected from the collider, the

Continued on page 29

Inside

- Which mainframe will Neodata buy? Tune in to page 27.
- EMC Corp. feels flattery is an art. Page 27.
- AT&T's new mini line will revolve around Intel chips, Kavner says. Page 27.

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EMC sports controller for the VAX

BY JAMES DALY
CW STAFF

HOPKINTON, Mass. — If imitation is the sincerest form of flattery, EMC Corp. will once again make Digital Equipment Corp. blush.

The storage upgrade vendor and perennial supplier of DEC-compatible equipment has released a series of high-capacity magnetic disk subsystems that it claimed are completely compatible with all VAX computers but sport a far superior price/performance ratio to DEC's comparable products'.

EMC claimed the key advantage of its Maxport series is its ability to store more information per DEC controller port than other magnetic storage products.

"A user has the option of storing up to 3.3G bytes while utilizing only one disk port," an EMC spokesman said. "This translates into three times more storage per port than any other disk subsystem."

Because users can store more on each disk port, they can save money on the purchase of future disk controllers, spokesmen for the firm said.

The Maxport series includes individual drives said to be capable of handling anywhere from 622M to 3.3G bit/sec. in storage. A preconfigured subsystem clocks in at 11.5G bytes, the firm said.

Maxport also claims an average seek time of 16 msec and a transfer rate of 2.8M bit/sec.; it is hardware-, software- and diagnostic-compatible with DEC's

Continued on page 33

ESA gives reason to go with IBM

ON SITE

BY J. A. SAVAGE
CW STAFF

BOULDER, Colo. — The product is data — consumer lists and demographics for publishing houses — and the factory floor is the computer room.

Craig Lord, data center manager at Neodata Services, a subsidiary of Dun & Bradstreet Corp., is trying to figure out which mainframe to buy to manage the data that represents the most critical part of his company's business.

Neodata handles subscription services for a growing number of magazines, and its current CPU, an IBM 3090 Model 200, is running at nearly 100% capacity 24 hours a day.

While the price of a new mainframe is a consideration for Lord, residual value and the availability of System Managed Storage (SMS) under IBM's MVS/ESA operating system are the deciding factors.

- **ESA.** Unlike many systems managers contacted when the MVS/ESA operating system was announced, Lord said he needs MVS/ESA properties now, and even if an IBM model is more expensive, the current availability of ESA could push Lord once again into IBM's cash-register line. "I believe that storage needs to be managed intelligently, heuristically and in real time, not by people poring over reports a week after the event," Lord said.

ESA, Lord said, is the "probable solution to some data access constraints I have today, like constrained access to the IBM IMS/DL1 databases. [SMS under] ESA gives me another place to put data, it's a little cheaper and you don't have to go out using channel protocol to get data," Lord said.

Since Neodata provides billing, renewal, test promotions, merging and purging of mailing lists, as well as demographic data for 200 magazines, including *U.S. News* and *World Report* and *McCall's,* storage and access are crucial to its customers.

"The update procedure is different for every magazine, every week, at the request of the publisher," Lord said. That adds to capacity constraints at the same time as he continues automating manual customer service, such as developing a 100-agent, customer service department that

Continued on page 30

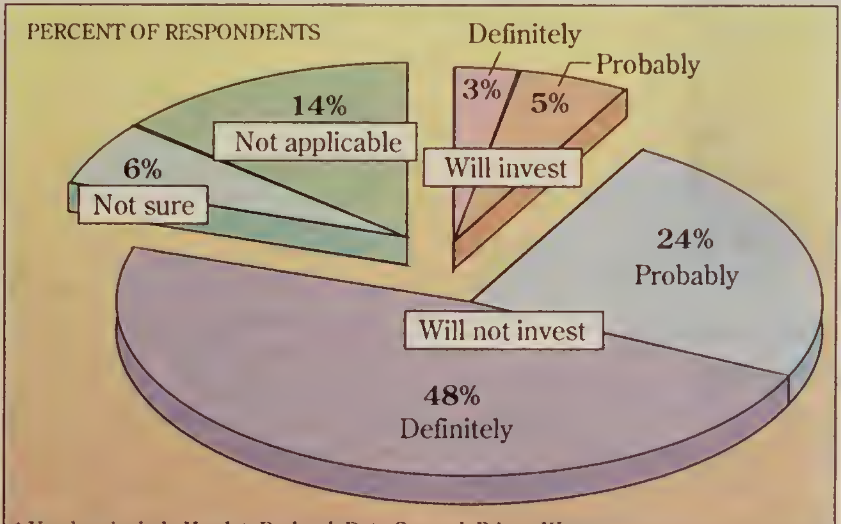
JOHN YORK

Which to choose? *That's the question at Neodata*

Data View

Vendor loyalty a barrier to Unix

The majority of 100 non-DEC minicomputer sites surveyed do not plan to invest in Unix during the next two years*



* Vendors include Hewlett-Packard, Data General, Prime, Wang

SOURCE: INTERNATIONAL DATA CORP.
CW CHART

AT&T teams up with Intel

Plans to build minis around 286, 386

BY JEAN S. BOZMAN
and WILLIAM BRANDEL
CW STAFF

CHICAGO — AT&T Data Systems Group is planning to build a new line of minicomputers around the Intel Corp. 80286 and 80386 line of microprocessors, President Robert M. Kavner said last week.

To that end, AT&T is forming a new product team to oversee development of Intel-based products ranging from standalone personal computers to high-performance minicomputers, he said.

Creation of the Intel group, which will combine product development from AT&T's PC and minicomputer operations, will not be formally announced until next month. But Kavner told *Computerworld* last week that AT&T will build a line of low-end and mid-range computers on Intel's family of 32-bit 386 microprocessors.

"Intel would like to go ahead and steal some of Motorola's thunder," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "It's a good

Continued on page 31

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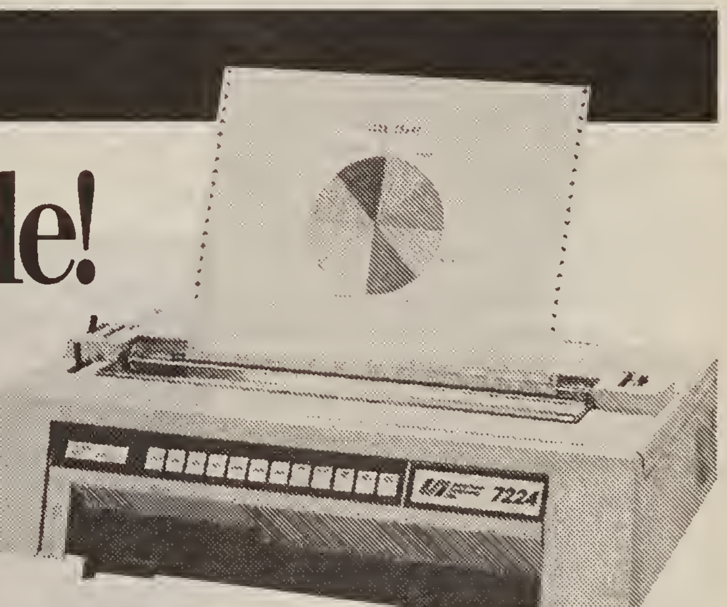

▶ The ISI 7224 prints at 53.7 dBA — quieter than the IBM 4224. And since it's only seven inches tall, it fits tighter spaces.

Gibson

FROM PAGE 25

Yes, but at least different.

You will be happy to know that there is no possibility that this publication will be renamed *Enterpriseworld.*

The more, the merrier. All right, so Enterprise is overused. But vendors must be given some credit. Although they chose an overworked term, they are headed in the right direction. Systems integration is gaining overriding importance. Most users I have spoken with over the past few months say it is their No. 1 concern.

It follows that all the vendors want to be in the systems integration market. The question is: Who will prosper by filling the largest spectrum of user needs?

Will Cullinet be able to reverse its fortunes by selling software tools to large corporations? Will hardware vendors expand their capabilities developed largely in selling to the federal government, adapting them to the commercial user? Along those lines, Unisys reorganized its efforts into the Complex Systems Group.

A question for users will be whether they want to do it themselves or have a contractor do it for them. Choosing a contractor has an advantage — you can specify a price and a date for completion. With in-house personnel, doing so may not be easy. Your leverage in case of cost overruns is limited.

On the other hand, there will be times when only the user company understands its business well enough to take charge of its operation. At the very least, choices will proliferate, and that's good.

Speaking of Cullinet . . . The software firm chose the occasion of its annual users' week to fire its volley in the benchmark shootout. In doing so, it ran the TP1 benchmark on a DEC VAX 8820 and Cullinet's IDMS/SQL Release 1.2 running on DEC's VMS Release 5.0.

Before revealing the product's peak performance of 43 transaction/ sec., Cullinet officials took pains to decry the scandalous state of benchmarking and to claim that they will take on anyone, anywhere, in a fair contest. "We'll belly up to the bar with anyone," one Cullinet official said.

> THERE will be times when only the user company understands its business well enough to take charge of its operation.

Well, one month before Cullinet performed its tests, DEC had shot off a major benchmark blast of its own at its announcement of DEC TP, its suite of transaction processing products. DEC called the Debit/Credit benchmark a worthy standard.

About then, the Debit-Credit Council, now renamed the Transaction Processing Performance Council (TPPC), was formed under the guidance of Omri Serlin. DEC joined. Cullinet joined. Oracle joined.

So why didn't Cullinet perform a full Debit/Credit benchmark rather than the TP1 subset? Further questioning revealed that Cullinet was intent on countering Oracle and its widely publicized benchmark results based on TP1.

There is another possible reason that Cullinet would seek to avoid a direct confrontation with DEC. Cullinet was running its test on a VAX and was performing the tests at a DEC facility in Marlboro, Mass.

One begins to see why Cullinet would hesitate to show clear superiority over DEC — if it could — or allow itself to be shown up by DEC.

Holy machismo! So much for bellying up to the bar.

In fairness, Cullinet did announce some kind of benchmark. And it is a member of the TPPC. All we can say is more power to that council — it has never been more needed.

Gibson is *Computerworld's* senior editor, software.

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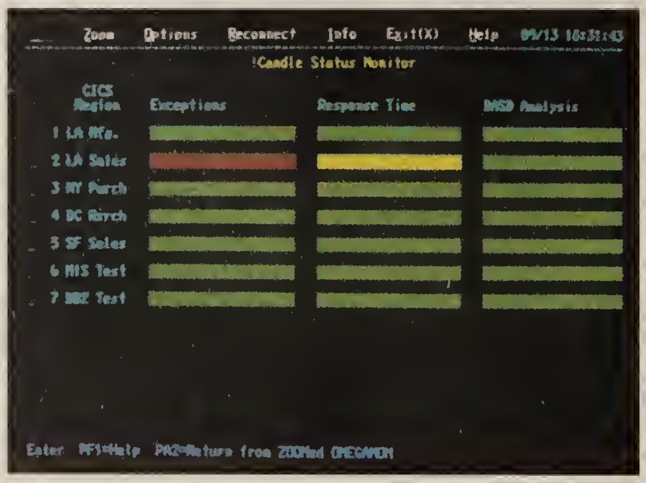

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IBM The Bigger Picture

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Atom-smash

FROM PAGE 25

center uses many different hardware environments. One of the main reasons the center standardized on Oracle six years ago was because of its multivendor support.

Today, Oracle is used for several applications running on an IBM mainframe, several Digital Equipment Corp. VAXs, a multitude of PCs and workstations, and will soon run on a Cray Research, Inc. system.

With 13 member nations as well as visitors from the U.S. and Eastern bloc, the mix of nationalities and equipment poses an integration challenge for CERN's data processing planners.

The seven-year project to build the 30-mile donut-shaped supercollider is expected to be completed next spring. A Vaxcluster running Oracle is dedicated to managing the logistics of the construction. A system developed using Oracle tracks the people and equipment involved and the logistics of getting the equipment into the tunnels.

The software requirements dictated by the huge project included relational databases, support for multiple hardware platforms, a comprehensive tool set and ease of use, according to Sergio Santiago, CERN's manager of central database support.

Oracle is also running on a 3090 under VM as the central, general-purpose database for business, engineering support and physicists' use. It is accessed by more than 3,000 users via 3270 terminals or emulation, but Vaxstations will soon be used to access the database, Santiago said.

At least 100 workstations running Oracle scattered around the accelerator, including Apollo Computer, Inc. workstations, IBM RTs and Vaxstations, control the operation of the accelerator. This represents a move away from using specialized equipment to using general-purpose workstations, Santiago said.

CERN also plans to use VAXs and IBM mainframes in place of specialized gear for data acquisition and reducing the volumes of data quickly.

To work around the language barriers, CERN standardized on English, although many applications are written in native tongues. Oracle software supports 8-bit formats that allow for foreign characters, according to A. R. Weiler, manager of international industry market development at Oracle.

IBM seeking

FROM PAGE 25

part," said William Milton, an analyst at Brown Brothers Harriman & Co. in New York. "They have nothing to lose."

Nothing, that is, except a little red ink. In recent years, IBM has been forced to formulate a little disaster recovery strategy of its own: domestic business is poor, it notched only a 5% growth in earnings and sales in its last quarter and it is perennially faced with the Sisyphean task of pushing a $50 billion revenue boulder uphill.

The disaster recovery business may be just what the doctor ordered. A spokesman for Sungard Data Systems, Inc., a current market leader, estimates that the $500 million disaster recovery arena is only about 25% penetrated.

Well-publicized calamities such as a fire at a telephone switching station in suburban Chicago in May that knocked out more than 150,000 computer-to-computer connections [CW, May 16] have also helped fuel user interest in the disaster recovery field.

Although IBM would neither confirm nor deny the talk, the normally reticent giant seemed uncharacteristically open to the idea. A spokesman's statement that the company "would not rule out" the move is akin to the "yup" Gary Cooper offers between the time he's asked if he's going to do anything about the local hellions and the time he straps on his six-shooter.

More answers, please

But there are still some dogging questions IBM must deal with. Under most disaster recovery arrangements, companies essentially buy an insurance policy that guarantees them space on a backup computer at a nearby hot site should their machines be immobilized by fire, flood or any other calamity.

Some observers have said that IBM would take a different approach from firms such as Comdisco and Sungard. Raymond Hipp, president of Comdisco Disaster Recovery Services, said he has heard reports that IBM is working on a fiber-based electronic vaulting technology whereby a computer automatically sends copies of its data to a machine at another site. Although the technology would not directly compete with Comdisco or Sungard, it could leave the door open for possible entry at a future date.

In any event, several disaster recovery firms have begun to prepare themselves for IBM's entrance into their turf by clenching their teeth and bleating out wooden statements like, "We'd be happy to see another competitor" or, "It would legitimize the business." IBM isn't in the ice cream business, either, but you can find 50 million cone-licking Americans who would say the industry is here to stay.

Sungard has even planned to head IBM off at the pass, saying that it has scheduled a meeting with IBM to discuss joint disaster recovery-related ventures. IBM has assured Sungard that it has no immediate plans to become a competitor, but when Sungard asked IBM to sign a statement to that effect, it refused.

While it is doubtful that this millenium will ever see a $91 million company like Sungard twist IBM's arm, disaster recovery firms should remember that leasing companies were given similar assurances before IBM Credit Corp. soaked up much of the leasing market by undercutting prices.

In other words, remember the immortal statement of baseball pitcher Satchel Paige as filtered through the computer age: Don't look back. A Big Blue giant may be gaining on you.

HARD BITS

Cray buys Convex for NASA

Convex Computer Corp. said **Cray Research, Inc.** has purchased three Convex systems to be used in a new supercomputer facility at the National Aeronautics and Space Administration's Langley Research Center in Hampton, Va. The research facility will use two Convex C120 systems as front-end processors to a four-processor Cray-2. A third system, the Convex C120, will be used for software development.

The Department of Energy's Argonne National Laboratory has licensed superconducting wire technology to **American Superconductor Corp.** in Cambridge, Mass. The technology will be used for development of high-temperature superconductors that lose their resistance to electrical currents when cooled by liquid nitrogen. In a separate agreement, American Superconductor will provide Argonne with $100,000 for research in other superconducting technologies.

The Data Services Division of **NCR Corp.** has launched a disaster recovery service for financial institutions. Called the 911 Disaster Recovery Planning System, the service will provide users with a personal computer-based software package, documentation, installation and training. NCR said the service will be implemented by McGladrey and Pullen, an accounting firm based in Minneapolis.

Artecon, Inc. said it will offer a three-year warranty for its line of storage subsystems for Sun Microsystems, Inc. workstations. The warranty covers parts and labor on external disk drive subsystems for 91M bytes to 1.2G bytes.

Seiko Instruments in Tokyo licensed the Sun Scalable Processor Architecture (Sparc) recently. Seiko will use Sparc in future high-end graphics workstations and servers. Seiko also signed a three-year, $50 million contract with Sun to remarket the Sun-3, Sun-4 and Sun386i workstations.

First Computer Corp. in Burr Ridge, Ill. and Southwest Data Products, Inc. in Houston have agreed to distribute **Arix Corp.**'s mid-range Unix-based systems.

ESA

CONTINUED FROM PAGE 27

has access to any subscriber's records. Agents may change data, add data and solve problems on-line.

Lord has 100G bytes of direct-access storage devices and enough tapes to wrap around the world — about 35,000 cartridges and 20,000 reels — which take up nearly half of Neodata's 13,000-sq-ft data center. However, he would rather not spend valuable time mounting tapes.

While considering IBM plug-compatible vendors, Lord said he was reluctant to go with them.

He was concerned that the most current operating systems available on plug-compatible mainframes (PCM), MVS/XA, would not offer SMS until later next year, and he doubts that there will be any enhancements to an original release.

- **Residual value.** Next to the availability of SMS, the monthly cost of the mainframe is Lord's concern. "That's simply the dictate of the market that says [a PCM] box isn't worth as much as an IBM box," Lord said.

The initial cost has to be looked at in a couple ways. "As cash flow, [a PCM] looks a little cheaper, but if you look at it as a budgetary monthly hit, and it has to be written down quickly [because of the lack of residual value], it's a bigger hit each month," he said.

Although PCMs have closed the gap of residual value with IBM in the last few years, analysts said they are still unequal.

- **Service-level agreements.** While Lord presents these quantifiable tradeoffs to Neodata's executive vice-president of finance, he said he could free up a lot more money for new compute power if he could quantify the service, or lack of service, his publishers are getting.

"Service is a matter of opinion. [Publishers] call on the phone and say the response time is terrible. I say it's good." Instead of being defensive, Lord would like to be able to have an objective service-level agreement with customers specifying response times.

"If I had a service-level agreement, I could go to the man and say, 'I cannot meet these agreements. I need to spend this much money. Give me a new computer.' "

- **Early PC strategy.** Big expenditures for big iron is the one thing that Lord still needs to worry about. What he does not need to fret over is distributed computing strategy.

"In 1983, there were three PCs in the company, and the handwriting was on the wall." He said that management was not resistant to the influx. Rather, it was a lack of understanding of their potential.

"The management of information, the definition of control and issue of integrity of data suddenly had changed."

Basically, users must get an IBM Personal Computer, or they are on their own for support and service. Users are on their own for budgeting for the PCs and buying programs. This has resulted in nearly 200 IBM PCs and two or three Compaq Computer Corp. clones.

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SOFT NOTES

IBM, Index link DB2, Excelerator

Computer-aided software engineering market leader **Index Technology, Inc.**, based in Cambridge, Mass., announced an interface between its flagship Excelerator software and IBM's DB2.

Working through a version of the Excelerator dictionary customized to describe and document DB2-related entities, the link lets database administrators automatically transform Excelerator-produced design data into SQL — a cumbersome task formerly done by hand. The SQL statements can then be used to implement a DB2 database, an Index spokesman said.

Available immediately for a site licensing fee of $7,500 on IBM Personal System/2, Personal Computer AT, PC XT and compatible platforms, the interface is compatible with relational database management systems such as Oracle Corp.'s Oracle, Relational Technology, Inc.'s Ingres and IBM's SQL/DS.

The New England chapter of the **Software Maintenance Association** is going to be activated following a year-long hiatus.

The group will meet at 4:30 p.m., Nov. 2 at Liberty Mutual Insurance Co.'s Data Center in Portsmouth, N.H.

Judy Gollub, the new president of the international organization, will be at the meeting. Contact Stewart H. Stephens at 603-431-8400 for more information.

Computer Power Group in Natick, Mass., has acquired the assets of **BBJ Computers Ltd.** in Australia for an undisclosed sum.

The acquisition reportedly includes BBJ's Today fourth-generation language, which has more than 4,000 licenses worldwide.

The Today product runs on more than 80 hardware platforms, including the Digital Equipment Corp. VAX/VMS, Hewlett-Packard Co.'s MPE, Prime Computer, Inc.'s Primos, IBM and compatible personal computers running Microsoft Corp.'s MS-DOS and systems operating most versions of AT&T's Unix.

The Computer Power Group provides software services including consulting, systems integration and application development.

Computer Power Group America Chief Executive Officer David L. Chapman, formerly at Cullinet Software, Inc., said the company is committed to making the Today product a major application development environment.

Stratus Computer, Inc. in Marlboro, Mass., and **Shared Financial Systems, Inc.** in Dallas recently announced the availability of Storenet/2, a retail communications system.

The product is a result of a joint development effort between the two companies and will be co-marketed. Storenet/2 collects and distributes point-of-sale data throughout a retailer's network. The software runs on Stratus XA2000 continuous-processing systems and is already being installed in three sites in two countries.

J. D. Edwards & Co., the Denver-based supplier of IBM mid-range software applications, has opened a European Support Center in Brussels, Belgium.

The office will provide sales and technical support to the company's current and future affiliates throughout Europe and the Middle East.

AT&T teams

FROM PAGE 27

deal for both of them [Intel and AT&T], but they have to create a working relationship."

AT&T is also committed to build a line of high-performance computers based on Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) reduced instruction set computing (RISC) chip, Kavner said. However, he said that plans for the Sparc-based line are still unfinished.

Kavner said the Sparc line will start at the high end and gradually come down to meet the Intel line in price/performance. He added that the two product lines will cross without merging because they are each targeted at different application markets. Kavner noted the Sparc line will be targeted at high-end transaction processing applications, while the Intel products will be used primarily as servers.

Dzubeck said Intel may have realized that IBM, which manufactures many Intel-based PCs, would probably never agree to build a mid-range product on the Intel microprocessor architecture. For AT&T, an Intel-based line would be, Dzubeck said, "a product differentiator from all the Motorola, Inc.-based minicomputer machines in the industry."

Until now, AT&T has been selling the 3B line of minicomputers, all of which are based on proprietary Western Electric chips. It also sells PCs on Intel's 286 and 386 chips.The Intel-based machines, manufactured by Ing. C. Olivetti & Co., run Microsoft Corp. MS-DOS and AT&T's Unix System V applications. AT&T holds a 25% stake in Olivetti.

The next generation of Intel-based AT&T computers will be designed to operate as PCs, mid-range and high-performance machines, Kavner said. "They will be in the high-performance world, offering as much as 100 MIPS [million instructions per second]."

The creation of an Intel product group will have the effect of providing Intel with a single point of contact within the AT&T organization. Kavner also expects to add units based on the Intel 80486 chip as soon as it becomes commercially available.

No target dates were given for the development of the next generation of Intel-based machines. But Kavner said AT&T had already started to talk about them with its design partners.

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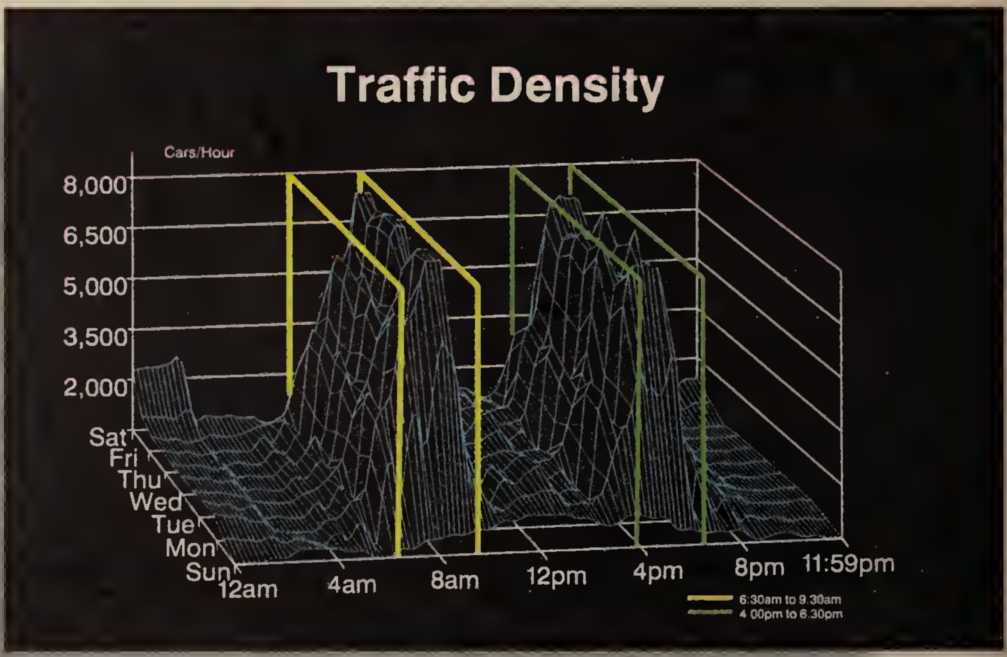

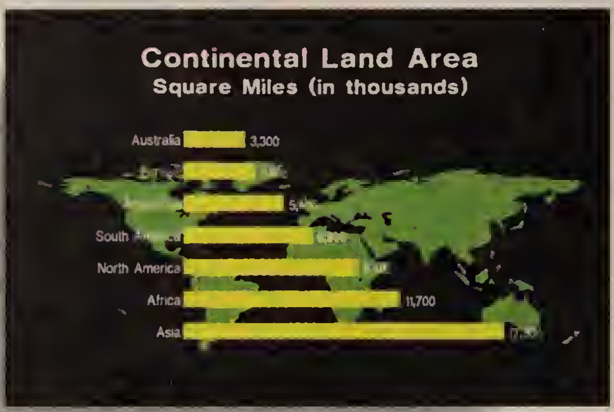

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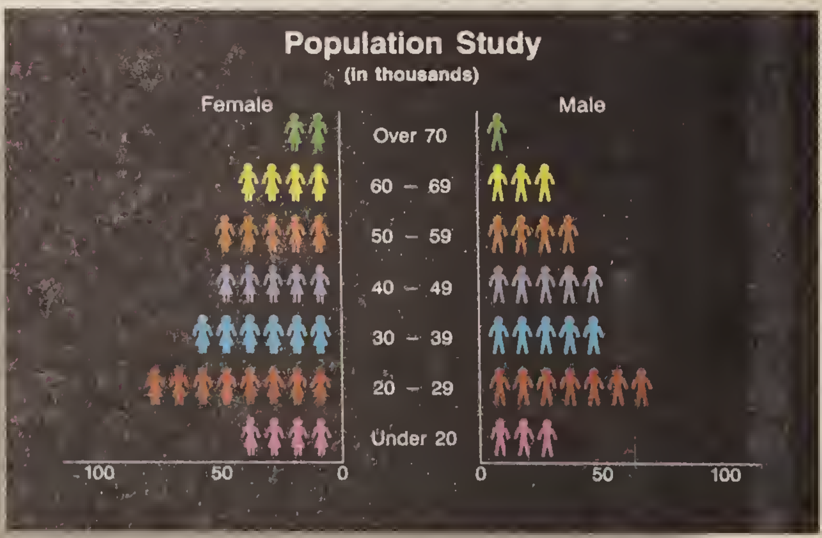

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   - 23. Dir., Mgr. Suprv., Analyst, of Systems
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   - 32. Programmer, Methods Analyst
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   - 36. Data Comm Network/Systems Mgt

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   - 12. Vice President/Asst VP
   - 13. Treasurer, Controller, Financial Officer
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   - 51. Sales/Mktg Mgt

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EMC sports

FROM PAGE 25

HSC50, HSC70, KDA50, KDB50 and UDA50 disk controllers, spokesmen from the firm said.

One-year warranty

Maxport also supports all DEC-level diagnostics and has thrown in a one-year warranty for the series.

Additionally, EMC's Maxsupport warranty plan includes its Remote Access Maintenance Plan, an on-line panel for continuous self-diagnostics and automatic formatting, spokesmen said.

The Maxport series is immediately available in two lines, according to spokesmen from EMC. The MRA, which is reportedly compatible with DEC's RA disk drive, comes in five models ranging from the 622M-byte Model 600, which sells for $13,400, to the 3.3G-byte Model 3200, which is priced at $64,000.

The other EMC model, the MSA 11000, is reportedly compatible with DEC's SA disk drive and consists of three MRA 3200s and a 1.64M-byte 1600. According to EMC, it sells for $215,000.

Unisys' 4GL

FROM PAGE 27

screens in the project, which is well on its way to completion.

The software, which will run on two Unisys A12 model mainframes, is a perfect example of what Unisys seeks to achieve through Linc and its other fourth-generation language, Mapper: to quickly create more applications, thereby selling more hardware.

In September, Unisys announced that Linc and Mapper would be offered on all Unisys hardware within 18 months [CW, Sept. 19]. According to Hugo Simpson, Unisys' vice-president of information and productivity systems, a user will be able to write a program for either family of hardware and the compiler or generator will handle the hardware and determine the kind of network, message control and database to be used.

Simpson hesitated to call SGA analogous to IBM's Systems Application Architecture, but there are unquestionably parallels. Under SGA, Unisys aims to mask disparate architectures, develop a consistent end-user environment and facilitate application portability across its different architectures. All of these are goals of SAA.

Unisys officials, however, said the major difference is that SGA is based on fourth-generation languages while SAA has no role for 4GLs yet. Another difference, Simpson said, taking a swipe at SAA, is that "SGA is real, and we know how to do it."

Although they were an afterthought to the computer industry's mega-merger of two years ago, the two fourth-generation languages now are being pushed to the forefront in Unisys' strategy.

Serendipitous

According to Unisys officials, the two languages form a serendipitous combination. Linc is good for writing large data center programs, while Mapper is good for constructing end-user applications.

Although an entire system including end-user tools can be built with either, Unisys is recommending that customers use both. Currently, that entails paying two license fees, but there will probably be only a single charge in the future, according to Simpson.

For Pyburn's purposes, Linc was sufficient, and he said he has no plans now to use Mapper.

After searching for fourth-generation languages as productivity aids in creating the application, he gravitated to Linc. Pyburn's goal at first was to find a software productivity method that would work with IBM hardware, which is prevalent in the mutual funds industry. However, he did not find anything that could outdo Linc. Although he had no experience with Linc or Unisys hardware, he proposed creating Colonial's system using those products.

Pyburn and his associates had to learn how to use Linc by taking a short course from Unisys. Selecting Linc would have been a far more natural decision for Pyburn had the language been more widely known.

With that in mind, Unisys aims to extend the reach of Linc and Mapper by porting them to non-Unisys hardware. Linc and Mapper will be offered on Unix-based systems as well, Simpson said. Unisys' ultimate goal for Linc and Mapper is an ambitious one: that they become industry-standard fourth-generation languages.

Deploying Linc and Mapper on other vendors' hardware will widen the market for third-party developers and encourage their acceptance as a de facto standard as well as creating selling opportunity in mixed-vendor sites, Simpson said.

However, despite professions of openness, Simpson said there are no plans to port Linc and Mapper to IBM hardware.

Porting Linc and Mapper to all lines of Unisys hardware is the first goal, however, and Unisys said that Mapper will be brought to the Unisys A series in the first quarter of 1989. Linc, in turn, will be brought to the 1100 series in the fourth quarter of 1988 on a runtime basis, with full development capability in May 1989.

Although observers have speculated that Linc and Mapper will be merged, Unisys stopped short of saying officially that Linc and Mapper will eventually become one. But the company has given indications that the lines between the two languages will grow increasingly less distinct.

Rather than merge the two languages, Simpson said, the language of both will probably be retained, but the databases and dictionaries will likely be combined. To create a common database, SQL will be used.

Used together, the two languages will function symbiotically: Linc will be for large systems databases and transaction processing applications, and Mapper will be the end-user system on top of it.

NEW PRODUCTS — SYSTEMS

I/O devices

Link Technolgies, Inc. has started shipping **MC5**, its video display terminal.

The very large-scale integration-based unit is a multiple-session, multiple-emulator terminal. The 14-in. display unit offers support for 17 emulations and three communications interfaces to provide connectivity to ASCII and ANSI environments. MC5 costs $549.

Link, 47339 Warm Springs Blvd., Fremont, Calif. 94539. 415-651-8000.

Xerox Corp. has announced eight hardware options designed to expand applications for the company's high-volume electronic printing systems — the Xerox 9700 and 9790.

The 9700 and 9790 systems reportedly print up to 120 page/min and are generally used in data centers, service bureaus and in-house publishing departments. The finishing products include a bypass transport option.

Pricing ranges from $1,300 to $8,600, and leasing prices are available on a monthly basis.

Xerox, Xerox Centre, 101 Continental Blvd., El Segundo, Calif. 90245. 213-333-7000.

An eight-pen, 25-in./sec. plotting device has been introduced by **Western Graphtec, Inc.**

The **GP2100-JC** is a pinch roller-type plotter that can accommodate media sizes A through D, the vendor said. The product features an RS-232 interface, Hewlett-Packard Co.'s HP/GL command protocol and 4K bytes of buffer memory standard, with a 1M-byte buffer memory optional. Several types of pens are available for use with the model.

The GP2100-JC costs $3,995.

Western Graphtec, 11 Vanderbilt, Irvine, Calif. 92718. 800-854-8385.

Falco Data Products, Inc. has announced a high-resolution graphics terminal that features six windows with variable size and position control, the vendor said. The product is being positioned as an alternative to the Digital Equipment Corp. VT330.

The **Falco 5330** offers support for concurrent processing from up to four hosts and includes four bidirectional ports. When used with the company's Unix minicomputers, the product can reportedly run up to six applications concurrently on a single line.

The terminal can display 25 to 50 lines of data on the screen and will support the Session Support Utility, which allows two sessions on a single wire from a DEC computer.

The Falco 5330 costs $1,295, and is scheduled for delivery this month.

Falco, 1294 Hammerwood Ave., Sunnyvale, Calif. 94089. 408-745-7123.

Data/Ware Development, Inc. has enhanced the remote diagnostic capabilities of its portable **DW345** channel monitor. The device is used to monitor I/O activity on IBM and plug-compatible mainframes.

According to the company, a remotely installed DW345 can now be switched on-site between terminal diagnostic mode and RS-232 modem diagnostic mode.

The DW345, including RS-232 communications capability, costs $14,495.

Data/Ware, 9449 Carroll Park Drive, San Diego, Calif. 92121. 619-453-7660.

MSI Data Corp. has enhanced its family of portable data terminals.

The **Model PDT** was developed as a low-end offering for applications with low data volumes, the vendor said. The device is available with either 8K or 32K bytes of random-access memory. The 8K-byte version costs $350; the 32K-byte unit costs $450. The terminals use either alkaline or rechargeable Nicad 9V batteries.

MSI Data, 340 Fischer Ave., Costa Mesa, Calif. 92626. 714-549-6000.

A series of minislot scanners designed to provide hands-free scanning in a point-of-sale environment has been announced by **Symbol Technologies, Inc.**

The **LS 5500** series is available in three versions: a plug-and-play configuration that operates via a scanner or optical character-recognition port; an integrated keyboard wedge interface designed for older systems; and a version designed to fit in the minislots of the company's interface controllers.

The LS 5500 series is priced from $1,495 to $1,695.

Symbol, 116 Wilbur Place, Bohemia, N.Y. 11716. 516-563-2400.

Advanced Technologies International, Inc. has unveiled two 12 page/min laser printers.

Both the **ATI 1270** and the **ATI 1275** were desgined for multiuser, PC-networked environments and provide 300 dot/in. resolution, the vendor said. The ATI 1270 tabletop model was developed for office use and costs $3,995; the ATI 1275, targeted at both office and commercial environments, offers Adobe Systems, Inc. Postscript support and is priced at $8,595.

Advanced Technologies, 355 Sinclair-Frontage Road, Milpitas, Calif. 95035. 408-942-1780.

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An image processing workstation that is built on the Motorola, Inc. VMEbus and acts as a peripheral to a user-supplied Sun Microsystems, Inc. Sun-3 workstation has been announced by **Vicom Systems, Inc.**

The **Vicom workstation** reportedly comes equipped with four Vicom image processing boards, a point/ensemble processor, a spatial convolver, 2M bytes of image memory and a 512K-byte buffered display processor. A VME-to-VMEbus repeater for interfacing to the user's Sun-3 workstation is also included.

The Vicom workstation is priced at $30,000 and is scheduled for delivery in December.

Vicom, 2520 Junction Ave., San Jose, Calif. 95134. 408-432-8660.

A terminal capable of displaying both text and video images that are stored on a computer database has been announced by **Image Data Corp.**

Christened the **Newimageterminal**, the product is compatible with the ANSI/Digital Equipment Corp. VT100 protocol and can include pictures of individuals, catalog items, real estate, medical images or manufacturing parts.

According to the vendor, the images can be stored on a minicomputer or mainframe database, and individual users may call up the images on demand. The unit comes with a standard RS-232 interface and includes a 9-in. gray-scale monitor. A 9.6K-byte modem is optional.

Newimageterminal is priced from $2,495 to $3,995.

Image Data, Suite 200, 11550 IH-10 W., San Antonio, Texas 78230. 512-641-8340.

Spectra-Physics Retail Systems has announced the **Freedom Scanner**, reportedly first in a series of flexible-mount, compact bar scanners to be offered by the company.

Designed for the retail point-of-sale (POS) environment, the product is said to measure 9 in. high by 12 in. wide by 3 in. deep. When mounted horizontally, the scanner is flush with the counter top to allow items to slide easily across the smooth, nonslotted scanner surface.

Two vertical-mounting options are also available, and the product is compatible with most popular POS devices, the company said.

The Freedom Scanner costs $1,395.

Spectra-Physics, 959 Terry St., Eugene, Ore. 97402. 503-683-5700.

RDK, Inc. has introduced a plotter for users working in computer-aided design and manufacturing environments.

Designated the **Model RY-5214**, the digital plotting unit is capable of plotting in either pen or pencil, the vendor said. Features include a 12K-byte buffer standard with a 256K-byte version optional; maximum paper size supported is 24 by 36 in.

The unit is shipped with four disposable "H"-style pens in four colors, four pencils and software for lead-out detection. The plotter stand is also included in the purchase price.

The Model RY-5214 costs $4,595.

RDK, P.O. Box 14743, Austin, Texas 78761. 512-832-5464.

Mad Intelligent Systems, Inc. has introduced a series of workstations based on the 20-MHz Intel Corp. 80386 microprocessor.

The **Series 3000 Intelligent Workstations** were designed to run under the MAD/IX operating system, the vendor's implementation of AT&T's Unix System V, Release 3. Features include up to 16M bytes of 32-bit random-access memory on a private memory bus, standard networking capabilities, high-resolution graphics and X Windows support with a 60M-byte streaming-tape cartridge system.

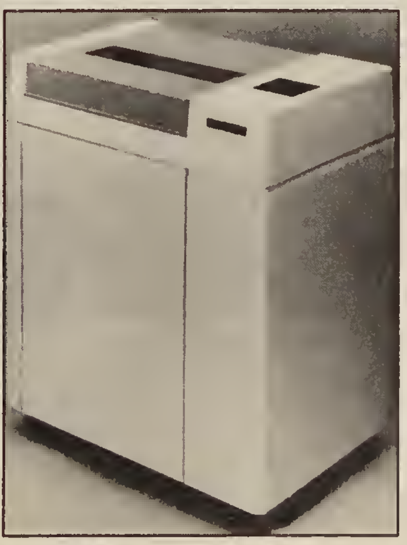
The products are also available in a file server configuration.

The Series 3000 Intelligent Workstations are priced from $14,000 to $29,000, depending on application configuration.

Mad, 2950 Zanker Road, San Jose, Calif. 95134. 408-943-1711.

Two dot matrix line printers that offer Digital Equipment Corp. LG01 emulation are now available from **Taneum Computer Products.**

The **TCP660** and the **TCP690** print at speeds of 800 and 1,200 line/min., respectively. Bar code and business graphics options are available at no additional charge.



A Taneum *printer*

The TCP660 costs $8,990, and the TCP690 is priced at $11,990. List price includes installation, a 90-day on-site warranty and operator training.

Taneum, 1123 Maple Ave. S.W., Renton, Wash. 98055. 206-228-5956.

A high-volume laser printer designed specifically for multiuser and networked computer systems has been introduced by **Talaris Systems, Inc.**

Dubbed the **T2492-B Printstation**, the device is based on the 24 page/min. Xerox Corp. XP-24 engine and the Talaris Printstation Control, which features an optional high-speed Ethernet connection. The printer includes a dual-processor architecture and 5.5M bytes of random-access memory and is configured with 43 fonts.

The Talaris 2492-B Printstation costs $24,990. Current Talaris 2400 customers will be able to upgrade by installing a 2492-B Printstation Control, priced at $7,990.

Talaris, P.O. Box 261580, San Diego, Calif. 92126. 619-587-0787.

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NEW PRODUCTS — SOFTWARE

System software

Goal Systems International, Inc. has announced new versions of its **VM** security software systems for IBM's MVS, CICS, VM and VSE environments.

According to the company, **Version 2.04** of **Alert/VM** has been enhanced to secure CMS files, and **Alert/CICS 5.02** now offers customizable sign-on screens and maintains password history.

Pricing for Alert/VM 2.04 ranges from $16,000 to $20,000. Alert/CICS 5.02 costs from $9,000 to $17,000, depending on CPU size.

Goal Systems International, 7965 N. High St., Columbus, Ohio 43235. 800-848-4640.

Database management systems

BMC Software, Inc. has announced **DB2 DASD Manager**, a capacity planning and performance tuning product that manages the life cycle of DB2 physical objects.

The software reportedly provides a comprehensive set of statistics that can be run on-line without making the table space unavailable or off-line against image copy data stats.

A perpetual license for DB2 DASD Manager costs from $15,000 to $51,250, depending on CPU type.

BMC Software, P.O. Box 2002, Sugar Land, Texas 77497. 800-240-8800.

Development tools

Execucom Systems Corp. and **Hewlett-Packard Co.** have announced that Execucom's **IFPS/Plus 3.5** modeling and financial planning software is now available to run on HP's HP-9000 minicomputer family under HP-VX, HP's version of the Unix operating system.

IFPS/Plus reportedly allows financial and business professionals to develop complex financial models and includes a relational database management with SQL-like query language. An artificial intelligence-based Explain Facility is also included.

IFPS/Plus for the HP-9000 is priced from $35,000 to $50,000, depending on the hardware configuration.

Execucom Systems, 9442 Capital of Texas Highway, Arboretum Plaza One, Austin, Texas 78759. 512-346-4980.

Control Data Corp. has introduced a product to its ICEM suite of computer-aided design and manufacturing software.

The **ICEM Parametric Modeler** is said to run on CDC's Cyber 910 workstation and reportedly includes parametric dimension-driven geometry, feature-based construction, solid modeling and complex assembly design and layout. The product was developed by Parametric Technology Corp. in Waltham, Mass., and is marketed by that company as the Pro/Engineer design engineering system.

The ICEM Parametric Modeler for CDC Cyber 910-500 workstations is priced from $14,500.

CDC, P.O. Box 0, Minneapolis, Minn. 55440. 800-553-2215.

Dynamics Research Corp. has released **Version 2.0** of **Adamat**, its automated Ada quality analysis tool.

The latest release is said to incorporate more than 150 Ada-specific metrics and offers enhanced configuration management capabilities.

Weighting, soft-switching and thresholding are included to allow the developer to customize measurement to relate directly to the code.

Adamat 2.0 is priced from $4,995 to $24,995, depending on system configuration.

Dynamics Research, 60 Frontage Road, Andover, Mass. 01810. 508-475-9090.

A fourth-generation software application generator that permits faster creation of on-line transaction processing applications has been announced by **Concurrent Computer Corp.**

Called **Reliance Builder**, the product is said to feature an easy-to-use nonprocedural language, a menu-driven format and a simplified editing procedure. Programmers may also elect to embed text where needed within the application to be called up at runtime by the end user.

Reliance Builder will cost from $7,900 to $27,900, depending on hardware architecture.

Concurrent, 106 Apple St., Tinton Falls, N.J. 07724. 201-758-7000.

Austec, Inc. has released **RM/Cobol-85**, an ANSI-standard Cobol development environment for AT&T, Interactive and Microport versions of Unix System V, Release 3 on Intel Corp. 80386-based microcomputers. The dual-standard compiler is reportedly CSA-certified error-free and allows users to compile applications to either ANSI 85 or 74 standards.

RM/Cobol-85 for Unix V on 386 machines costs $2,250.

Austec, Suite 300, 1740 Technology Drive, San Jose, Calif. 95110. 408-279-5533.

A Prolog development environment for users of Sun Microsystems, Inc. workstations has been released by **Applied Logic Systems, Inc.**

The **ALS Prolog Compiler — Sun Workstation Version 1.0** compiles the native reverse benchmark into code that executes at 115K logical inferences per second (LIPS) on a Sun-3/50 and 215K LIPS on a Sun-3/260, the vendor said.

Tail recursion optimization and debugging facilities are also provided.

The compiler costs $4,200.

Applied Logic Systems, P.O. Box 90, University Station, Syracuse, N.Y. 13210. 315-471-3900.

Worldwide Data Corp. has released **Version 1.65** of **Charm**, the company's C-source database application generator for Digital Equipment Corp.'s Ultrix and other Unix platforms.

Version 1.65 is being shipped with Techcentral, a technical support management system for software developers, and the vendor is releasing full source code listings for both products.

Charm 1.65 is priced from $6,999 for a DEC Microvax II version to $39,995 for a DEC VAX 8800 machine.

Worldwide Data, 17 Battery Place, New York, N.Y. 10004. 800-451-8424.

Encore Computer Corp. has announced a package of parallel Fortran programming tools specifically tailored for the Encore Multimax parallel processing system.

The **Encore Parallel Fortran** package is a family of compatible parallel tools, including a parallelizing compiler, optimizer, analysis and function tools. Language extensions, a code generator and a parallel runtime are also provided. The system runs under both of the company's Unix-based operating systems: Umax 4.2 and Umax V.

The Encore Parallel Fortran package costs $12,500.

Encore Computer, 257 Cedar Hill St., Marlboro, Mass. 01752. 617-460-0500.

Applications packages

Ross Systems, Inc. has introduced an interactive administrative purchase order system developed exclusively for Digital Equipment Corp. VAX computers.

Called **Maps/PO**, the system reportedly allows companies to manage purchases without requiring a bill of materials or inventory. Functions include purchase order processing, receipts processing and vendor and buyer analysis. The product allows for full receipt and invoice matching, and all functions are available through a menu-driven user interface.

Maps/PO costs $25,000 and higher, depending on CPU.

Ross Systems, 1860 Embarcadero Road, Palo Alto, Calif. 94303. 415-856-1100.

Leford Software has announced that its **Access Credit** and **Summary Credit** software programs have been released in a format to run under the Xenix operating system.

The software was designed to allow companies to integrate credit-reporting software with existing applications in a multiuser environment, the vendor said. The Access Credit and Summary Credit packages are said to be part of a complete library of microcomputer-based credit and reporting software offered by the company.

Access Credit Xenix and Summary Credit Xenix cost $1,295 each.

Leford Software, Suite C, 612 Hampton Drive, Venice, Calif. 90291. 213-399-5511.

A billing and order-entry system designed for the IBM System/38 has been announced by **Packagedeal, Inc.**

Designated **Billing/Order Entry,** the package is said to include invoice entry, shipment entry and invoice printing capabilities. The system also includes facilities for handling contracts and standing orders.

The product can be used in a stand-alone configuration or interfaced with the company's inventory, accounts receivable or general ledger packages.

Billing/Order Entry costs $3,350.

Packagedeal, 6366 Guilford Ave., Indianapolis, Ind. 46220. 317-259-4189.

Dickens Data Systems International is now shipping **Building Blocks**, its integrated multiuser, multitasking office automation software for IBM RTs. The product integrates word processing, spreadsheet, SQL database manager and natural language query capabilities in a windowing environment, the vendor said.

The software license fee is $4,500.

Dickens, Suite 230, 3850 Holcomb Bridge Road, Norcross, Ga. 30092. 404-448-6177.

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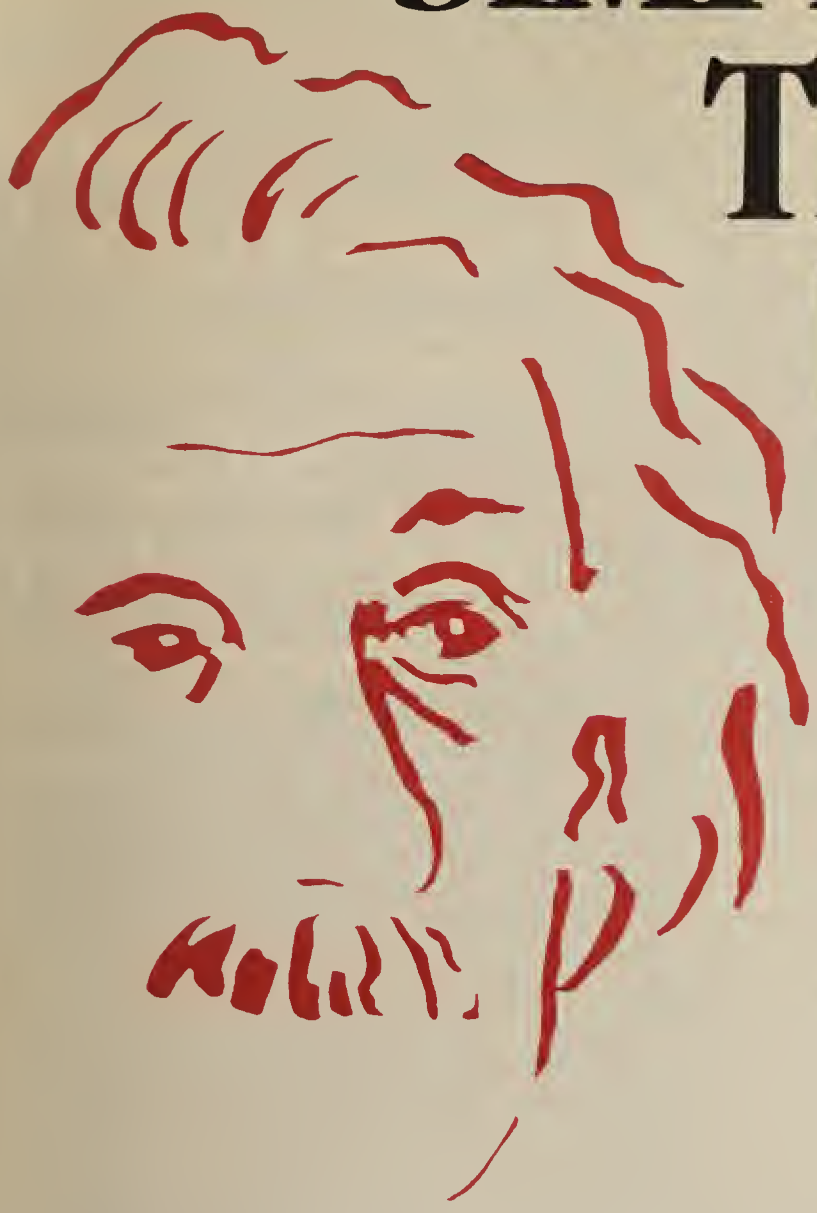

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Effective immediately, **H. J. Hansen Co.** has reduced prices for its **Dart** (Data Accumulation and Retrieval of Time) software. Dart was written for industrial engineers and costs estimators.

Version III.0, which was released late last year, will now sell for $10,000.

The product was previously listed at $29,000.

According to the vendor, a typical Dart system consisting of Dart III.0 with the Cue and Light Assembly databases will now be priced at $15,500 instead of the previous $40,000 charge.

All training formerly included in the software sale is now offered only on an as-needed basis, the vendor said.

H. J. Hansen, Suite 2A, 600 E. Higgins Road, Elk Grove Village, Ill. 60007. 312-439-7979.

Classic Systems, Inc. has enhanced its loan servicing software package to include Adjustable Rate Mortgages and Federal National Mortgage Association Laser Reporting functions.

Max 3.0 was developed for small to medium-size mortgage servicing companies and can reportedly service up to 20,000 loans. According to the vendor, transactions are entered via CRT and then verified on-line.

Additional batch edits and control reports are provided to ensure data integrity, and the system contains nine menus and a help text. The software runs on IBM Personal Computers and System/36 minicomputers.

Max 3.0 costs from $1,500 to $10,000, depending on system size and individual configuration. Installation and training are available for an additional charge.

Classic Systems, 230 S. Congress Ave., West Palm Beach, Fla. 33406. 407-967-4939.

Access Technology, Inc. has upgraded its spreadsheet software package for mid-range computers. **Release 2.3** of **20/20** is now available, and the software is now portable to Digital Equipment Corp. VAX computers, the company said.

Other enhancements to the product reportedly include 21 additional string, data and special functions and a macro debugging capability. The software also offers support for DIF data and optional interfaces to popular database management and word processing packages as well as to DEC's All-In-1 office automation system.

20/20 Release 2.3 costs from $3,400 on the Microvax II to $35,000 on the VAX 8978.

Access, 6 Pleasant St., South Natick, Mass. 01760. 617-655-9191.

MCBA, Inc. has begun shipping an enhanced release of its **Fixed Assets and Depreciation** package for Wang Laboratories, Inc. VS computers. The package now supports the Alternative Minimum Depreciation method of depreciation and includes a built-in interface to Wang's Office, the vendor said.

Other functions reportedly include depreciation of "luxury" automobiles per the Internal Revenue Code of 1986 and use of the General Ledger Account file to validate numbers used in Fixed Assets and Depreciation. Reports may be distributed via Wang Office to any user on the system.

License fees for Fixed Assets and Depreciation range from $4,500 to $9,000, depending on the Wang VS model.

MCBA, 425 W. Broadway, Glendale, Calif. 91204. 818-242-9600.

Deneb Systems, Inc. has released **Version 4.1** of its **Construction Accounting and Estimating System** for Prime Computer, Inc.'s Unix-based supermicrocomputers, the EXL series.

According to the vendor, this release makes Prime the first system to run Version 4.1 of the software, which was developed under the guidelines of the RM/Cobol 85 standard.

The product consists of 12 applications, including Estimating, Job Cost, Payroll, Accounts Payable and Receivable and Equipment Control.

Construction Accounting and Estimating System Version 4.1 ranges from $1,495 to $1,595 per application.

Deneb, Suite 2C, 201 Riverside Drive, Dayton, Ohio 45405. 513-223-4849.

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The new Kodak Optistar Autotouch finisher for the Komstar imaging system is productive proof of Kodak's continued commitment to the COM industry.

The Kodak Optistar Autotouch finisher lets you duplicate and collate fiche for optimum results with minimal operator intervention. And this new finisher's touch screen makes it uniquely easy to operate. Superb Kodak service and support, combined with advanced technology, assure high reliability and increased productivity. Compatible with current and future technologies, this important new product once again demonstrates Kodak's continued commitment to the COM industry. For more information, talk to your Kodak Business Imaging Systems representative about the Optistar Autotouch finisher, or call 1 800 445-6325, Ext. 303.

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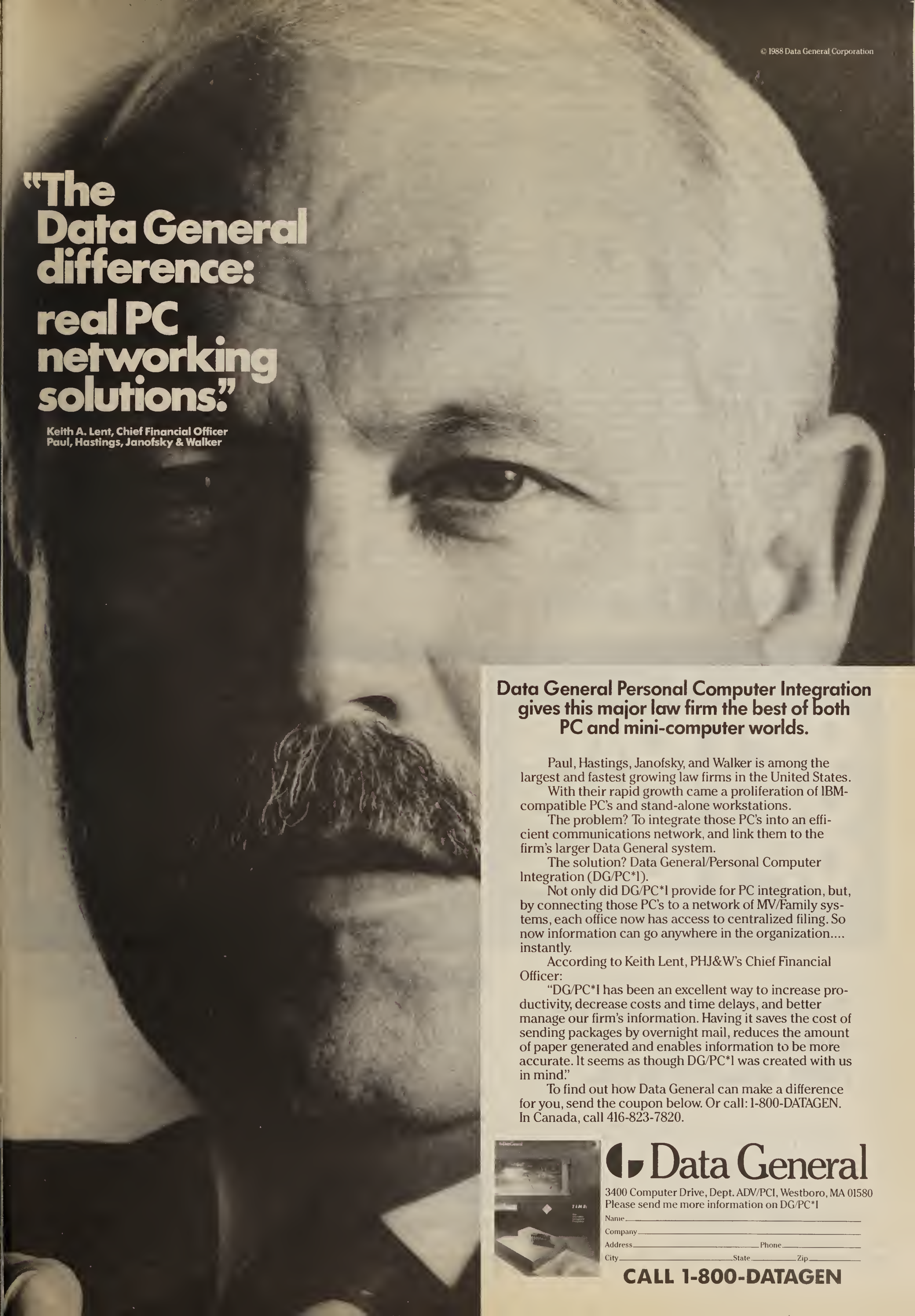
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Utilities

Pansophic Systems, Inc. has released **Version 14.0** of **Panvalet ISPF**, its control and management system for source program libraries.

The latest release provides direct compiler input results in reduced I/Os and CPU time, the company said. Library concatenation for multiple libraries is supported for edit, browse and utility functions, and a new copy and language change utility is also supported. Panvalet Subsystem Support allows foreground processing under TSO.

Pricing for Panvalet ISPF 14.0 begins at $48,000, depending on the number of CPUs.

Pansophic, 709 Enterprise Drive, Oak Brook, Ill. 60521. 312-572-6000.

A file compression and expansion utility for file-transfer operations in a Digital Equipment Corp. VMS operating environment has been announced by **Innovative Computer Systems, Inc.**

FCX Version 1.0 reportedly permits files of any type or size to be compressed into a single file. The vendor claimed this offers users a space savings ranging from 30% to 70%.

The software supports compression and expansion of directories and directory trees; file selection by type and date; preservation of file characteristics and protection information; and full use of wild cards.

FCX Version 1.0 ranges from $900 to $3,000 in price, depending on VAX size.

Innovative Computer, 72 Crooked Lane, Cherry Hill, N.J. 08034. 609-779-1422.

An archiving and retrieval package that was developed for users of Wang Laboratories, Inc. VS systems has been announced by **The Software Connection, Inc.**

Called **Kwic-Archive**, the product reportedly allows users to find, archive and retrieve documents within word processing applications. The software can archive as many as 1,000 documents per hour, the vendor claimed; an automatic batch operation function is available.

Kwic-Archive costs $3,000.

The Software Connection, P.O. Box 4014, Englewood, Colo. 80155. 303-798-8028.

Unison Software has updated **Tapes**, its automated tape library system. **Version B.01** is reported to be compatible with the Hewlett-Packard Co. Spectrum series.

Other features include an improved scratch-tape allocation program and an option to print a label for a designated tape. The operator is provided with either a complete list of tapes in use or a list by job and session number, the vendor said.

Tapes is priced from $1,800 to $5,700, depending on hardware configuration.

Unison, 415 Clyde Ave., Mountain View, Calif. 94043. 415-968-7511.

A program said to recover used files under the Unix operating system has been announced by **Systems Access, Inc.**

Called **Recovery Solution**, the menu-driven product does not alter the kernel when in operation, the vendor said. The program is complemented by another software package, **Hide-Peek-Seek**, which reportedly allows the directory owner to cloak files, list cloaked files and uncloak files. Both products will allow only the owner or root user privileges.

Recovery Solution costs $199 for a minicomputer configuration. Hide-Peek-Seek is included free with the purchase.

Systems Access, 239 Rte. 22 E., Green Brook, N.J. 08812. 201-968-1047.

BRS Information Technologies has announced that its **BRS/Search Software** is now available for use on Cray Research, Inc. supercomputers.

The full text and retrieval software is written in C and generates and maintains an index of every word in the textual collection. According to the vendor, instant retrieval is possible using any word or combination of words. Average response time is reported at typically 2 to 3 sec., regardless of system configuration or volume of data. The software runs on a variety of micro, mini and mainframe computer platforms.

BRS/Search Software is priced from $1,000 for a personal computer version to approximately $180,000 for the Cray configuration.

BRS, 1200 Rte. 7, Latham, N.Y. 12110. 518-783-1161.

A menu design tool developed specifically for the Digital Equipment Corp. VAX VMS environment is now available from **Ergodic Systems, Inc.**

MDS32 is said to allow seamless integration of application programs, DEC's Document Control Language (DCL) and menus without repeated process spawns or image activations. Three DCL-style commands are included for defining menus, items on menus, actions and other text and screen attributes. Menu definitions are read from text files and can be changed at any time.

MDS32 is available at $995 for a limited introductory period.

Ergodic, 23666-A Birtcher, El Toro, Calif. 92630. 714-380-9719.

Two on-line, real-time performance measurement products for Honeywell Bull, Inc. computers running under the GCOS8 operating system are available from **Systar, Inc.**

Called **Olga** and **Boris**, the products are reportedly capable of monitoring several thousand characteristics of the mainframe and peripheral subsystems. Results are displayed as multicolor curves and bar graphs to allow the user to solve performance problems, tune the computer system and display trend data for resource management in real-time or replay mode.

The products are also available for the Unisys Corp. 1100 mainframe environment.

Olga and Boris are priced from $8,000 for an annual license.

Systar, Suite 212, 6404 Ivy Lane, Greenbelt, Md. 20770. 301-220-0104.

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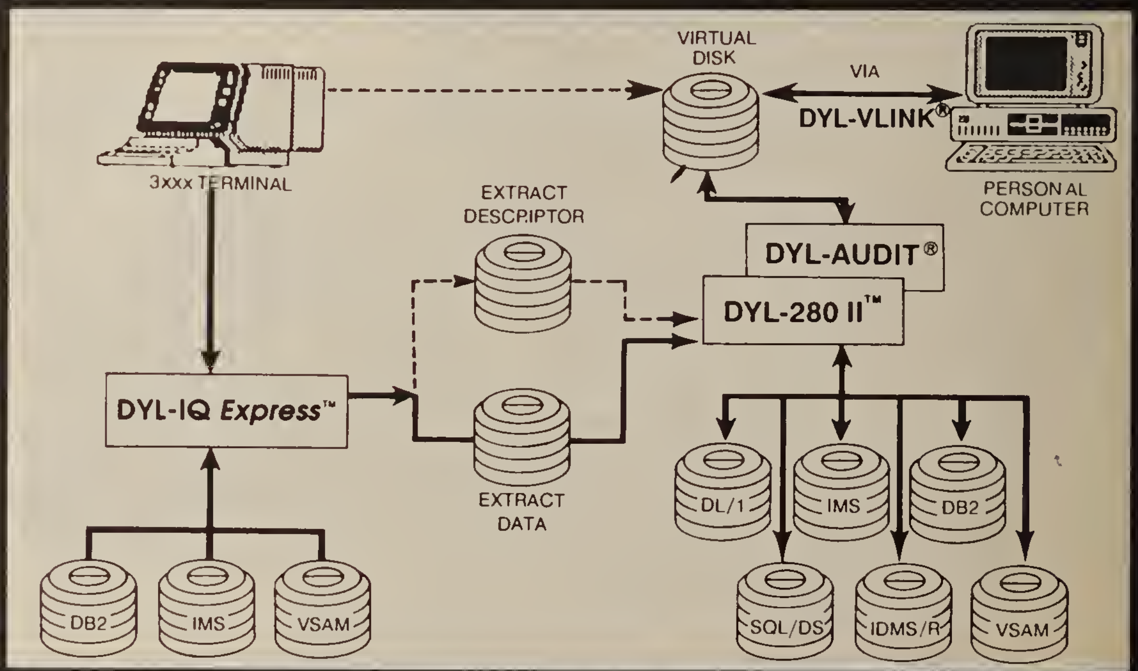

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Douglas Barney

A lot of bite left

Can the tater keep growing? While Ashton-Tate remains top dog in the personal computer database management system market, more critics are seeing little more than an arthritic old mutt. As this market finally moves into a new generation of technology, Ashton-Tate is all gums and no bite, competitors and critics say.

But if you look at Ashton-Tate's past, you see that the company has grown sharp, healthy teeth that may give it a good bite of the future. In fact, those who say the past is Dbase and that the prologue to the future is something else may have it wrong.

Here's the history. Earlier this decade, Ashton-Tate quickly became the PC DBMS kingpin after acquiring a database product that had its beginnings nearly 20 years ago, according to Dbase author C. Wayne Ratliff. Dbase took form at the Jet Propulsion Labs, where it ran on one of those large lumbering mainframes. Its heart and soul is not a bunch of menus or concrete forms. More than anything, Dbase remains a language that older hackers still call JPL.

Continued on page 51

A look at the future, OS/2-style

IBM talks about its plan to lay a foundation for computing's next wave

BY DOUGLAS BARNEY
CW STAFF

IBM's OS/2 Extended Edition operating system is indeed a mystery. And no wonder: Hardly anyone is using it yet.

But despite the unknowns, the hoopla and the sometimes rampant criticism, in the back rooms of Austin, Texas, IBM continues to enhance the software. And IBM is equally hard at work explaining to the world how this software may lay the groundwork for the future of IBM-style computing. *Computerworld* recently got a bit of Extended Edition perspective from a full day's briefing at the Austin facility.

Some three years ago, IBM planned to extend OS/2 with little more than communications facilities, said David Harrington, product manager at IBM's Entry Systems Division. About six months after that, IBM realized that, as with larger systems, a database management system should be the center of any robust systems software.

Birth of a method

And because the relational database architecture was born more than a decade ago at IBM's San Jose Research Library, it was decided that both SQL and the so-called Relational Model would provide the product's underpinnings. Thus was born the OS/2 Extended Edition Database Manager.

Adding the database component was more than just a theoretical exercise. In fact, IBM research indicated that 75% of personal computers in key markets already ran communications and database software. And in the tying together of communications and the database, the beginning of IBM's low-end distributed database strategy can be found.

Continued on page 49

Filling the holes in MS-DOS

BY DOUGLAS BARNEY
CW STAFF

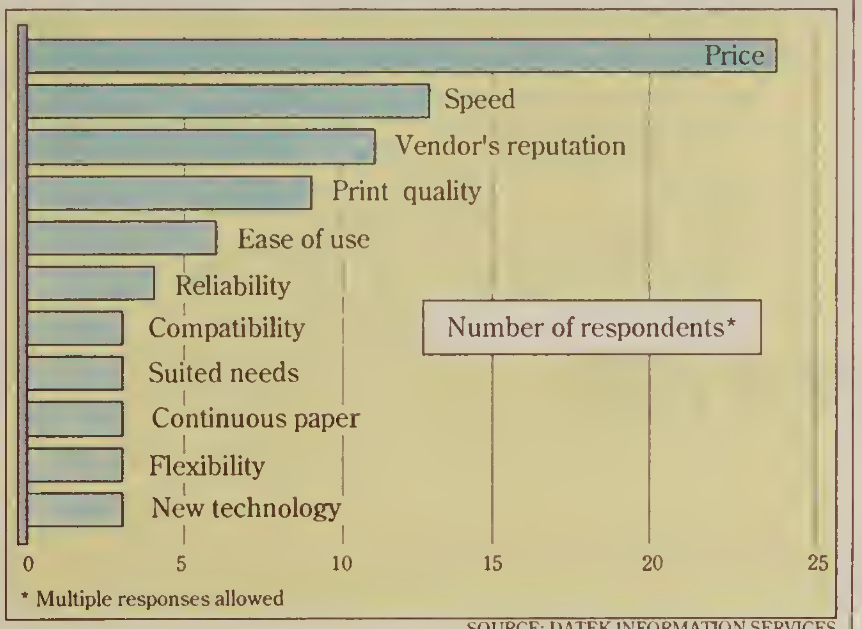
MANCHESTER, N.H. — Softlogic Solutions, Inc. has done pretty well filling in the holes that often make Microsoft Corp.'s MS-DOS annoying. Want easy task switching? Call Softlogic. Need to retrieve an erased file or consolidate files on your hard disk drive? The boys from Manchester may be able to help.

Continued on page 47

Data View

What's the attraction?

A survey of 49 European users of magnetic printers reveals why they purchased this technology rather than investing in laser printers



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Okidata printers pose fire peril, are recalled

BY MICHAEL ALEXANDER
CW STAFF

Okidata Corp. has given thermal printing a new meaning. The company is in the midst of a major recall of two of its popular Microline dot matrix printers that Okidata said pose a potential fire hazard if left unattended for too long.

The two models, the Microline 320 and 321, are plagued by a faulty chip that is used in both printers, according to Okidata spokesman Cliff Rockwell. If left on for six to eight hours, the chip may disintegrate, causing the printer to overheat and smoke, he said.

"It is not likely that the printer would burst into flames. The case is flame-resistant," Rock-

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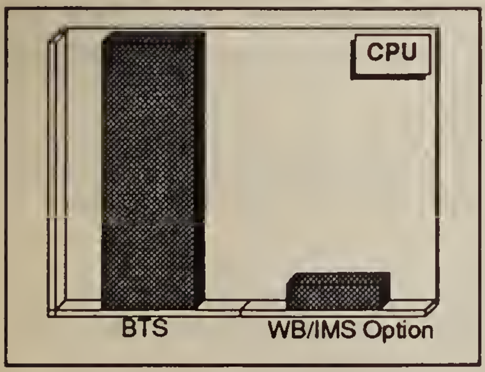
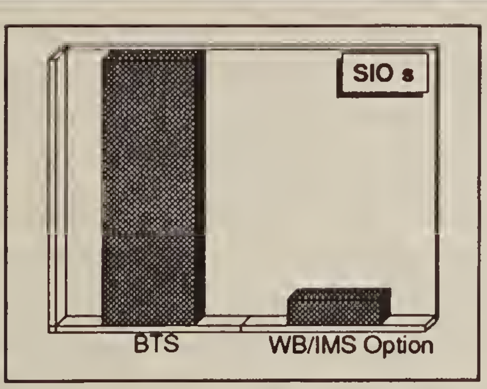
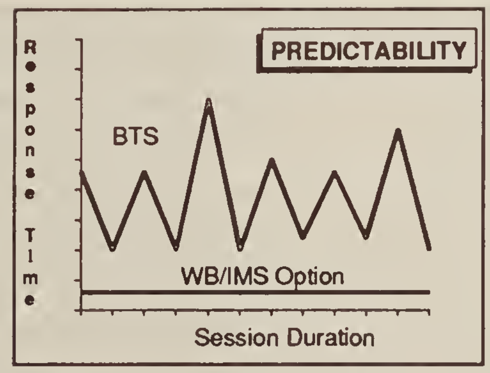
Inside

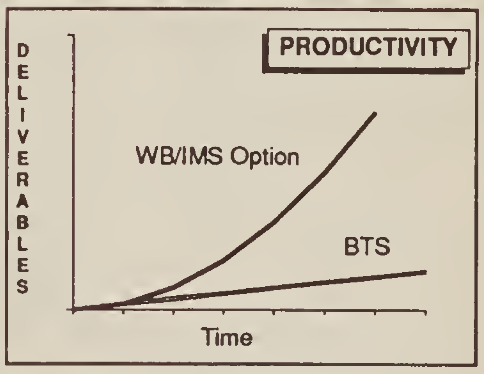
- Tandy thinks EISA is dandy. Page 45.
- Can Air Force pilots let fingers do the flying? Page 45.
- Feeling uptight? Call Stress Busters. Page 45.
- Dquery makes end-user life easier. Page 45.

Technology Breakthrough: IMS DB/DC on a PC !









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Before now, choosing a laptop PC meant choosing what you could live without. A manageable size. Battery. Power. Speed. Screen quality. Full-size keys.

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The COMPAQ SLT/286 snaps into an optional Desktop Expansion Base for office use.

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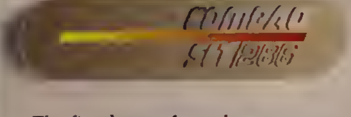

The first laptop from the company that set the standard for portable PC's.

From its compact size to its high-performance components, you'll see that your needs shaped our thinking.

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The COMPAQ SLT/286 has VGA graphics with 640x480 resolution with eight shades of gray. New backlit screen technology produces text and graphics with higher contrast on a 10″ diagonal screen. So things are easy to read.

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Other creature comforts are also on board. Like an optional internal 2400-baud modem. Room for two internal storage devices. Ports for a printer, external VGA monitor and other peripherals. You can even add a 12-MHz 80C287 coprocessor as an option to speed number crunching.

At this point you may be thinking that the COMPAQ SLT/286 does everything a desktop can do. You're right. In fact you can even do more at the office with its optional Desktop Expansion Base.

Unlike competitive expansion units, ours wasn't an afterthought. Its integrated design gives you two industry-standard expansion slots along with duplicate interfaces for your peripherals. The expansion unit even recharges the battery for you.

Battery included for over three hours of power.

Best of all, the COMPAQ SLT/286 just snaps right into the Desktop Expansion Base. No cord. No wires. No hassle.

With all these innovative features, you can see that the new COMPAQ SLT/286 leaves absolutely no room for compromise. It's simply high-performance personal computing in its most concentrated form.

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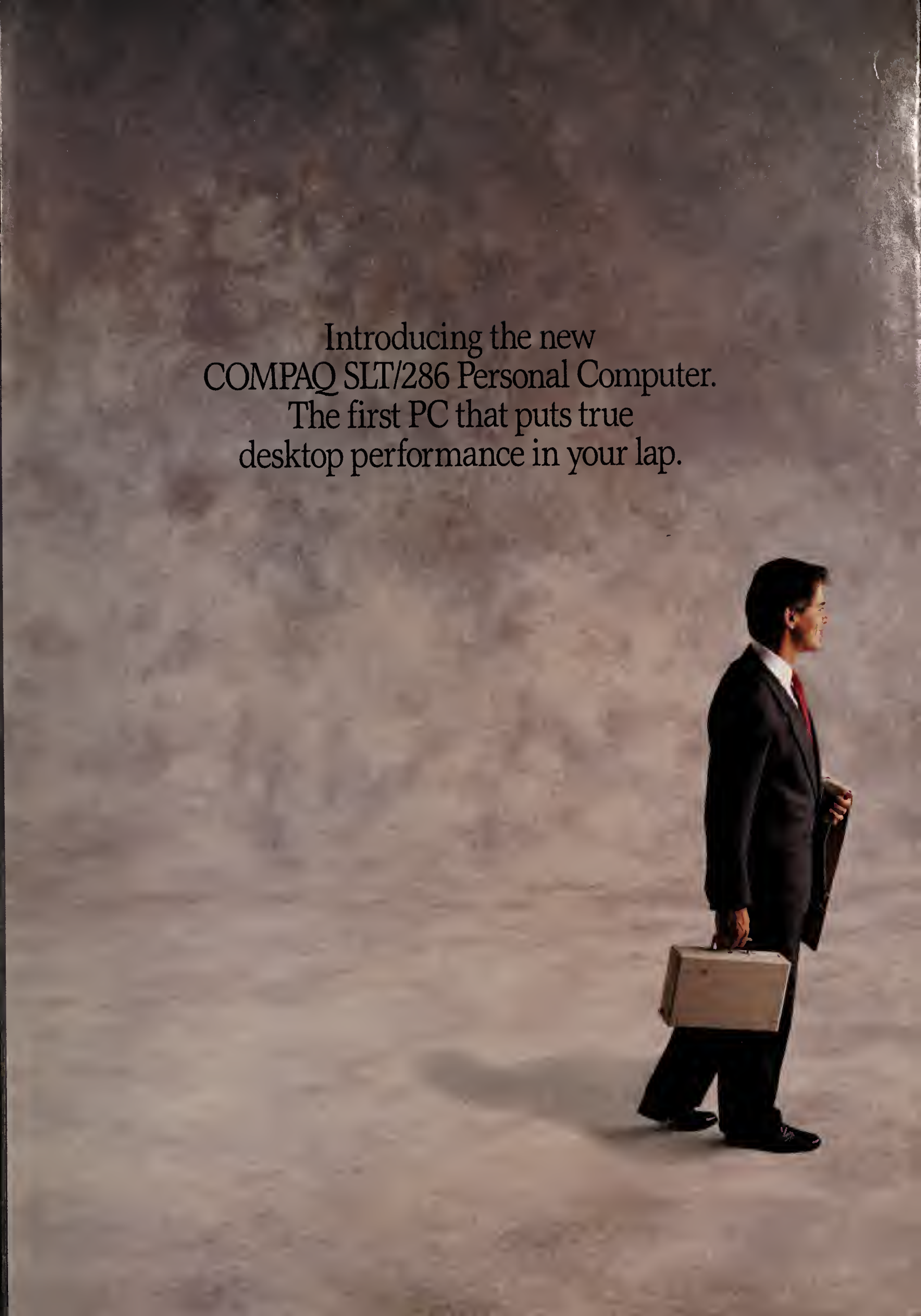
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MAC NUGGETS

Julie Pitta

Steve Jobs, Version 2.0

Last week's product introduction by Next, Inc. was as much the debut of the new Steve Jobs as it was the occasion to introduce a new workstation.

The Jobs that emerged after nearly three years last week was a mellower model than that of his time at Apple. Jobs, who walked onto the stark auditorium stage amid cheers from his staff and third-party developers, has abandoned the bow ties and jeans of his Apple days in favor of a conservative business suit. His hair was neatly trimmed. In sum, he looks the part of the serious young businessman he hopes the world will perceive him to be.

The transformation is more than cosmetic. Today's Jobs can poke fun at his own image. During a demonstration of the workstation's on-line dictionary, Jobs looked up "mercurial," a word commonly defined as "changeable" and one often used to describe him. The definition of mercurial led him to "saturnine: of a gloomy or surly disposition." "I think I'll stick with mercurial," he quipped.

More important than his new-found humility, Jobs has gained some savvy as a marketer during his absence.

He hasn't lost the ability to capture a crowd. Even the cynical press corps — which endured one delay before the event began and a second before the subsequent interview that

Continued on page 48

Tandy buses bound for glory?

IN PERSON

Encumbered by a reputation for being the supermarket brand of computing, Tandy Corp. has spent the last year trying to spruce up its shelf presence. It began laying the groundwork in the summer of 1987 by establishing a separate sales force for large corporations and sprucing up its Radio Shack retail outlets.

More dramatic changes were to come. In April, Tandy and its Texas neighbor, Dell Computer Corp., became the first clone makers to duplicate IBM's proprietary Micro Channel Architecture (MCA) with the introduction of IBM Personal System/2 compatibles. Dell was to later drop its plans to ship a PS/2 clone. In August, Tandy became the only personal computer vendor to ship a PS/2 compatible.

When a consortium of leading PC vendors, chip makers and software giant Microsoft Corp. challenged the Micro Channel, Tandy was there as a cautious gambler hedging its bets. The Extended Industry Standard Architecture (EISA) consortium has stated as its mandate to extend the capabilities of the AT bus.

Tandy's membership in EISA makes it the sole PC vendor, other than IBM, to support both architectures. Recently, Tandy Chief Executive Officer John Roach spoke to *Computerworld* West Coast correspondent Julie Pitta about the company's unique strategy.

Roach *spruces shelf presence*

Why is Tandy supporting EISA?

Tandy in general is very supportive of standards, and we think that it's important that the industry have a fairly limited number of standards. This action is an indication that, in the MS-DOS and OS/2 worlds, there will be only two standards.

It's our job to provide to customers what they want. We would like to be on whichever bus leaves the station. It's very possible the buses will coexist.

Why not a single standard? Why splinter the standard at all?

I think there are limitations to the Micro Channel from the standpoint of its ability to utilize and work with the existing base of microcomputers as nicely as it might. There has not been any real indication from IBM that they would like a broad base of the industry to adopt a single standard.

They've been invited to join EISA. I have no idea what IBM will do and what might be in their best strategic interest. For ex-

Continued on page 46

A cockpit design with the right stuff

BY WILLIAM BRANDEL
CW STAFF

The U.S. Air Force has discovered that its Top Gun pilots sometimes suffer from optical overload, a condition caused by trying to view too many objects when flying at the speed of sound. In an effort to overcome this problem, officials are now testing a personal computer program to assess whether pilots can monitor jet speed by touch.

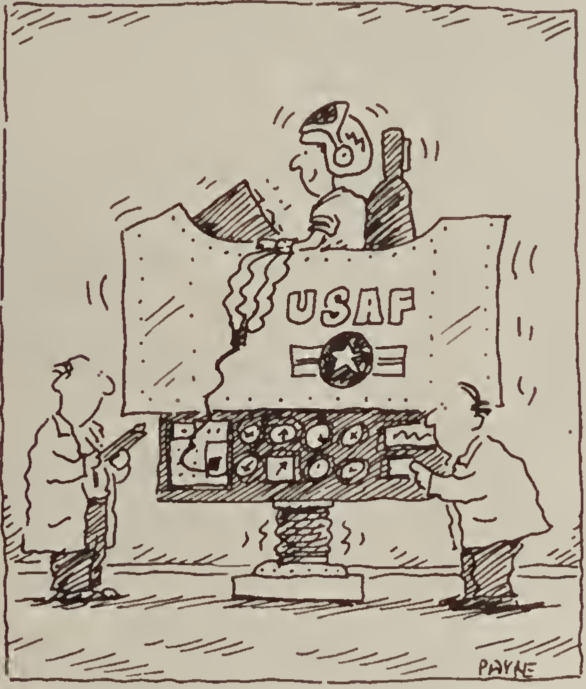
Pilots and researchers for the Air Force are launching the "cockpit of the future," a flight simulation project contracted to Northrop Corp.'s Aircraft Division in Hawthorne, Calif.

The goal of the project is to enable jet pilots to monitor flight speed by means of electronic signals sent to their forearms, said Todd Cary, a programmer at Ariste Software, under subcontract to Tacticon Corp. in San Rafael, Calif.

Cary was brought into the project by Tacticon President Frank Saunders, whose electronic stimuli display technique has enabled deaf children to communicate by touch. His electrotactile device transmits signals via gold-plated electrodes taped to a deaf child's abdomen. The Air Force is interested in implementing this touch technique so the pilots can save their eyes for other critical matters.

"At the speed these aircraft will be traveling, the pilot's mind can only focus his eyes on one thing at a time," Cary said. "If this project is proven effective, pilots [can] use their eyes to focus on whether they are overstretching the aircraft's limitations, to track missiles or to close in on an enemy target.

Continued on page 47



PC stress kit spells user relief

BY MICHAEL ALEXANDER
CW STAFF

MONTREAL — End users know that personal computers can often make their jobs considerably easier and, in the process, help alleviate a bit of stress. But what do you do if the PC is what is causing stress?

The Montreal Center for Stress Management has come up with a solution. Perhaps not surprisingly, it is a stress management software package for PCs. The Stress Busters program offers a series of relaxation techniques that can be performed in a matter of minutes without having to leave your PC.

"It's as easy as taking a

Continued on page 46

Query manager skirts roadblocks

BY WILLIAM BRANDEL
CW STAFF

End users facing an applications backlog in information services are more likely these days to take on the task of writing their own applications. Quadbase Systems, Inc.'s updated SQL query-by-entry (QBE) reporter, writer and engine for Lotus Development Corp.'s 1-2-3 and Ashton-Tate Corp.'s Dbase III gives them the power they will need to accelerate past the applications roadblock.

Dquery 2.1 is an SQL- and QBE-based ad hoc query management system that includes a relational microcomputer database engine, an SQL, an IBM DB2-compatible interface, a QBE interface and a report writ- . With windows and function keys, it gives the user a multiple-window environment and an added sense of self-reliance.

Without calling on MIS to make files accessible to them, users can build their own queries by checking off forms drawn on the screen in a template-assist mode. The product is easy enough to use that Big Eight accounting firm Arthur Young & Co. is bundling Dquery with its own business applications, said Michael Masterson, the company's micro systems specialist.

"The convenient thing for us is that it works against Dbase III data files and can query anything that SQL can do," Masterson said. He asserted that with personal computer databases becoming more powerful, SQL is becoming a standard base of knowledge for programmers, especially for downloading files through a PC or terminal from a host system. Thus, Dquery enables programmers to learn SQL in a stand-alone micro configuration, further enhancing efficiency.

"Once the SQL queries have been set to code, the product does the rest," said Ed Pick, a software developer at FDP, in Miami. "We manage Quadbase, and it manages the SQL calls automatically," he said.

Tim Doshier, a programmer at Texaco, Inc. in Midland, Texas, said that using the product has allowed Texaco to migrate many of its database applications from a minicomputer to a more cost-effective microcomputer environment.

"Some applications purchased off the shelf, like graphics processing, are better done on micros," Doshier said. "This development tool allows us to regear our data processing to the micro line. It's sort of a bottoms-up approach to writing applications."

Dquery 2.1 requires 512K bytes of random-access memory and has a list price of $150. It runs on the entire line of IBM Personal Computers and compatibles with Microsoft Corp.'s MS-DOS 3.1.

Quadbase is also releasing Dquery/Lib 2.1, which consists of a set of Microsoft C-callable routines. The product allows the developer to build fast relational database applications by using any compiled Dbase programs. It has a suggested retail price of $295 and includes Dquery 2.1.

Quadbase's Dquery 2.1

Price: $150

- 512K bytes RAM
- IBM PC, XT or AT, PS/2 and compatibles
- MS DOS 3.1

Tandy

FROM PAGE 45

ample, I was surprised to see them return to the AT standard with their recent product announcement.

The consortium has said that EISA will be a superior architecture to the Micro Channel. How do the two compare?

[EISA] certainly possesses architectural differences that, if they can be utilized, could make it a higher perfomance bus. Both are actually very high-performance buses.

But there's still not an enormous need for that kind of performance by the majority of computer users.

If you were an MIS director, which architecture would you choose?

There are a lot of factors that would enter into that decision. I think that they should choose whatever makes the most sense in their particular case.

What should be the factors?

One of the most critical factors is the current systems and the investments you have in them. Many have made sizable investments in Micro Channel machines already. Many have made no investment in Micro Channel machines. Some have made a much stronger commitment to the AT bus and a logical extension is the EISA bus. At this time, individual MIS directors may have performance needs that may dictate a certain bus. Most of those implementations are limited because there hasn't been time to develop the software and operating system.

Which architecture will offer the best platform for OS/2?

It's not clear that there will be a significant difference. Microsoft has indicated that they will support both. Many [purchasing] decisions are not made on what's the absolute best performance.

You've spoken of distinctly different markets for EISA and Micro Channel machines. Won't you try to sell EISA and MCA systems to the same types of customers? Where is the separation in the market?

You certainly may offer them to the same types of customers. That, in turn, becomes an opportunity for us because we are letting the customer make the choice rather than dictating the choice.

Some have said that EISA is a ploy to force IBM to reduce its licensing fees. What is your response to that statement?

I do not view it as that kind of move, personally.

How difficult has IBM made it to clone the Micro Channel?

From a technical standpoint, it's not difficult. From a legal standpoint, there are real factors that anyone has to deal with that cannot be overlooked.

PC stress

FROM PAGE 45

breath and as natural as tensing and relaxing isolated muscle groups," said R. deForrest Shelley, director of the center. "Once people learn how it's done, it becomes second nature."

At predetermined intervals, the stress management program pops up on the PC screen to guide the end user through a sequence of relaxation exercises and stress management techniques. Best of all, the exercises can be performed inconspicuously while the user is seated.

Each time the program comes on the screen, it greets the user with a cheery "Hello again! Time to take a breather!" After each break, the end user feels relaxed and refreshed and is more alert and charged with renewed energy, according to the stress center.

The program is compatible with virtually all software running under Microsoft Corp.'s MS-DOS 2.0 or above. It has a suggested selling price of $49.95.

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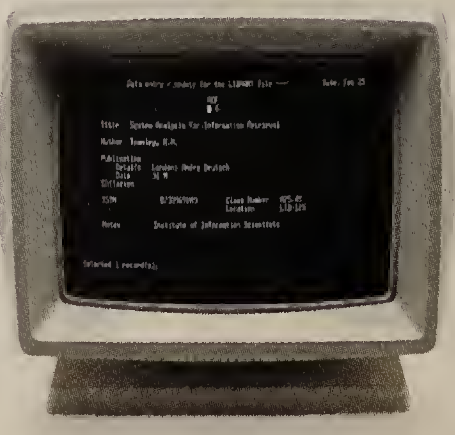

MS-DOS

FROM PAGE 43

Now Softlogic has combined the best of its utility software under one shrink-wrap. Called Fat Cat, the $139 package combines an MS-DOS shell and file management system with security, data compression and performance optimization.

The product sits on top of MS-DOS and replaces the MS-DOS file system. Files can be copied in groups, backed up, erased or sorted simply by highlighting and executing a menu choice. Since the product is separate from MS-DOS, users do not need to reload programs.

Fat Cat can also reportedly boost hard-disk performance by 70% to 300% by reallocating files to contiguous disk sectors. In layman's terms, it means putting files that belong together, together.

A file recovery system enables users to determine how long erased files should remain archived. Erased files can remain on disk for up to 255 days.

Unlike other compression utilities that work only with specific file types, Fat Cat can compress an array of spreadsheet, word processing, database and program and binary file types.

For those interested in file manipulation, Softlogic offers a subset of Fat Cat called Classifile, which sells for $89.

Softlogic also produced a new version of its $295 spreadsheet compiler called At Liberty. With it, users can develop a spreadsheet model and distribute it to others without needing a spreadsheet program to run it. Macros and formulas can be completely hidden.

For application developers, At Liberty can crank out models that do not even resemble a conventional spreadsheet. The system works with any spreadsheet that creates .WKS files. Users can distribute an unlimited number of runtime models.

Cockpit

FROM PAGE 45

Meanwhile, they won't have to be watching their takeoff speed or reading speed gauges during critical moments [of] a mission."

Each pilot's forearm is wired with 12 electrodes to test stimulus response. With a keystroke, Cary's program prompts a PC to send a digital signal that is converted to analog by a converter loaded in the computer. (Cary uses a Compaq Computer Corp. Portable III with Lotus/Intel/Microsoft Expanded Memory Specification.) The analog signal creates a vibration on the pilot's arm to convey the electronic message. Cary's PC program functions as an interface to the electro-tactile device and also graphically displays the analog signal's intensity level in real time.

Cary uses Borland International's Paradox database because it allows him to write applications in Turbo C. Northrop's software specifications require a minimum stimulus response time of 5 msec. By writing in Turbo C and storing the program's utilities in memory, Cary met that requirement.

Although the true test of the future cockpit will take place miles above the Earth, researchers can view stimulus reactions at their own desk tops. The intensity level is assigned a score from zero to 15 and is presented in a bar chart on the PC screen.

The future cockpit project may not be moving ahead at the speed of sound, but Cary said the software tools allowed him to complete the project within 50 hours of programming time.

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Pitta

FROM PAGE 45

was held in a room too small to accommodate the throng — walked away impressed with the new machine. Many also walked to nearby restaurants, since the press-conference luncheon was a Jobs special: cream cheese and sprouts on a croissant and mineral water.

While the Jobs of yesterday might have played David to IBM's Goliath, this time he is cautious. He has even enlisted his one-time nemesis IBM as a strategic partner: The Armonk, N.Y., giant has licensed much of the Next workstation's system software for use on its own workstations.

The new Jobs insisted that the workstation will be sold exclusively to universities. "More companies tend to die of indigestion than of starvation," he said.

Few believe that Jobs will limit himself to the academic market, however. An executive at Sun Microsystems, Inc. last week said that Sun's sales force has already run into Next at industrial installations.

It looks like Jobs is playing a game of setting modest expectations, which he will meet and likely surpass, as opposed to setting unrealistically high goals and falling short.

The target will eventually be Apple. Jobs last week robbed Apple of its image as a technology leader and fresh alternative to IBM's perceived stodginess. "Mac is going to peak next year," Jobs said. "There are cracks in the hardware that let you see it won't become more than it can be." The Mac is stuck in the 1980s, while the Next workstation is a computer for the 1990s, he said. After a three-hour razzle-dazzle display of the machine's capabilities, many left in agreement.

> WHILE the Jobs of yesterday might have played David to IBM's Goliath, this time he is cautious.

As could be expected, Apple sounded uncomfortable in its new role. "We're not standing still," a spokeswoman said. Apple may have beat Jobs to the punch with its own introduction of a Motorola, Inc. 68030-based workstation, but few will remember the chronology.

What will linger is the feeling that Jobs did what he set out to do: serve notice that he is back and upstage Apple in the process.

Pitta is *Computerworld*'s West Coast senior correspondent.

Okidata

FROM PAGE 43

well said. "But it could go so far as to char the paper."

The problem was discovered in the two printers last month at one of the firm's beta-test sites. The two models were introduced in April and shipped in May.

Okidata is mounting an extensive recall campaign that includes notifying its distributors and retailers to stop selling the units and asking them to advise their customers to bring the printers to an authorized repair center.

Retailers have been given notification kits to send to buyers of the printers that instruct end users how to get the units fixed within a 48-hour turnaround period, the company said.

The repair is a 30-minute procedure that involves swapping a circuit board containing the faulty chip for a new board.

The retrofit is free. In addition, buyers will get a free ribbon, a one-year warranty on the printer and reimbursement for shipping charges if applicable.

Rockwell was unable to estimate how much the recall will cost Okidata. "We really don't have an idea how much it will cost, because we do business through distributors," he said. "But it will be a substantial amount."

SQL Performance for OLTP.

Tandem challenges anyone.

OS/2 style

FROM PAGE 43

That distributed database strategy will mature under a three-phase process. The first phase is available today: a single-user database that implements much of the relational model devised by former IBM scientist Ted Codd and uses SQL patterned after IBM's mainframe-based DB2.

The second phase will arrive sometime next year and will implement the so-called client/server model. Under this model, multiple client workstations can access data on a common server.

After that comes more fully distributed data with which users can transparently make requests to a number of machines and data-base architectures. Think early next decade for this, our IBM sources indicate.

While some have criticized IBM for the shortcomings of its jack-of-all-trades approach (OS/2 Extended Edition has a wide range of communications and database features), IBM officials are nonplussed.

While competitors point to the 3M to 6M bytes of random-access memory and 20M bytes of hard-disk space needed to run the product, IBM points to the software's modular approach. Users can simply load the components they need and stick the rest on a shelf.

Another criticism of the jack-of-all-trades approach is that each module is outshined by other vendors' software. IBM tends to disagree with this theory but argues that any off-the-shelf OS/2 application can be traded for any Extended Edition component.

IBM has also been criticized for not working aggressively enough to merge OS/2 Extended Edition with the IBM and Microsoft Corp. Presentation Manager graphical user interface. Like most vendors, IBM says users should look to 1989 for key Presentation Manager applications such as Extended Edition.

Adding full Presentation Manager support is only one way IBM plans to enhance Extended Edition. Version 1.1, due out next month, will also include the Union command for easily combining sets of data and added communications features.

> WHILE SOME have criticized IBM for the shortcomings of its jack-of-all-trades approach, IBM officials are nonplussed.

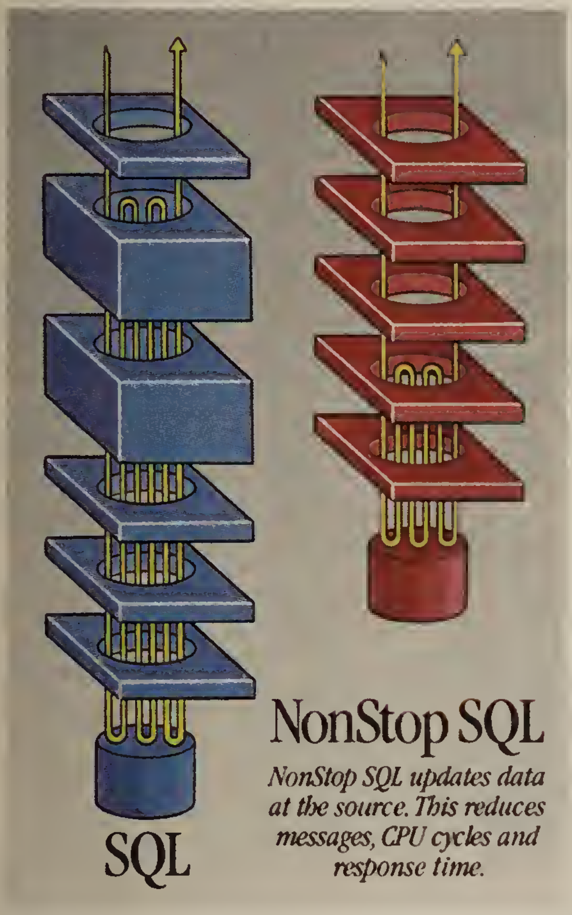
Version 1.1 will also provide the elimination of the 32M-byte restriction on hard disk drive volumes. Users can create volumes of up to 1G byte, according to IBM.

That's the ticket

But if users are waiting for DOS-based machines to act as clients talking to the Database Manager, third parties may be the ticket. IBM still has no announced plans to provide this capability.

In some ways, the OS/2 Database Manager is ahead of its mainframe counterpart DB2. The Extended Edition Query Manager Facility, for example, has both prompted queries and customized menus and panels.

Once IBM enhances the product and OS/2 Extended Edition begins to take hold, the need for these little primers should be eliminated. But until then, IBM will just keep on talking.



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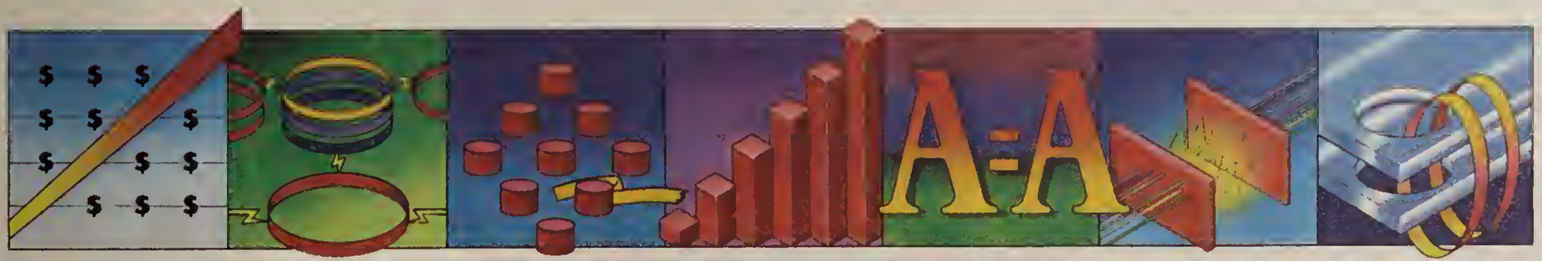

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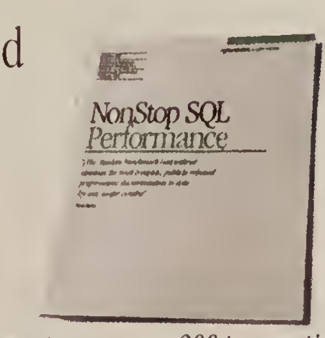

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    File Directory Edit Option Application Compose Log Xdos
Run highlighted program

Root Dir                Directory   16 Jun 1987           3:57:11P
  ANSI           SYS       2713
  AUTOEXEC       BAT         61
  COMDEX7        BAS      23610     Volume Label    SYS:PRODMKTG
  COMMAND        COM                                          32
  CONFIG         SYS                                          84
  MAPOEM1        PRN                                          48
  MAPOEM2        PRN
  PARK           COM                                          88
  TV31           COM                                          24
  XCOPY          EXE                                          64
 Basic                   Dire
 Convert                 Dire
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  CONVEPT        USP        522     System Log is Currently   T0
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Barney

CONTINUED FROM PAGE 43

It made it to micros in the form of Dbase II (there never was a Dbase I) and, by virtue of its early entry and a bit of raw power, was almost uncontested in its rise to the top of the charts. And because so many people learned the Dbase language, its follow-on, Dbase III, owns the market today. It is this nearly same language upon which the future of Ashton-Tate depends.

But finally, critics have questioned how long the Dbase language can last in a market finally headed for radical change. These bashers should remember the people who — years ago — asked the same questions about Cobol and are embarrassed to see how much is done with that language today.

Fortunately for Ashton-Tate, today's micro DBMSs are still predominantly single-user and only occasionally get data from bigger machines. But technology is coming that will change all that.

First, the hardware is getting better much faster than the software. Better chips make multiuser micros more accessible, and these same chips offer access to large amounts of random-access memory, which allows for more sophisticated applications. And hard disk drives keep getting faster and bigger, allowing for more users and more data.

Second, networks have improved by leaps and bounds. It is now possible, and in some cases even easy, to tie all these PCs together and let users share a common base of information.

Finally, there is the software, the most central element that is unfortunately taking the longest to arrive. And it is this very long wait that has allowed Dbase to solidify its position as a key database development language and slowed the move to other architectures.

Ironically, this new software technology comes from large mainframes and minis, on which people have long been used to sharing data. At the center of these systems is usually a database, and on top of that are applications that some company or group of in-house programmers wrote.

The most efficient way found so far to work with this data is the so-called "relational database," which essentially allows users to easily discover relationships between multiple data elements. And, as with Dbase, there is a language with an incredibly boring name that gets data on request.

With relational systems, that language is called SQL. Although SQL is vastly more efficient than Dbase, it is not as full. So if users want to generate fancy programs, SQL has to be embedded in another language. Ashton-Tate hopes that language will be Dbase.

But competitors hope otherwise. Now all the big micro players are charging after the relational market. And Ashton-Tate, along with a couple million users, is being drawn into a future far different from its Dbase past.

The trick for Ashton-Tate is to migrate its users to SQL without losing it all. So here comes Dbase IV, which adds SQL, and will eventually front-end more robust database back ends.

This is Ashton-Tate's first big step toward the future, and although it is still fraught with problems, it may make the transition possible.

To the extent that users wish to retain the past (as in millions of Dbase applications) as they move to the future, they will look to Ashton-Tate for direction. But when and how smoothly this migration occurs is a question only Dbase itself can answer.

Mega Multimate. Early next year, Ashton-Tate plans to fight off Wordperfect and Microsoft Word with a hot new version of the tiring Multimate. Tate has apparently hired one of the designers of Microsoft's Excel to create a smaller, tighter word processor that is "almost what-you-see-is-what-you-get," our source says. We also hear there is a special Australian version called Another-beer Mate. That sounds even better.

Writing an Opus. Microsoft is finally putting the last touches on its Windows-based word processor, formerly code-named Cashmere after Bill Gates' beloved sweaters and now dubbed Opus.

From all reports, this baby is going to be wild. Not only do the graphics make word processing worlds easier, but the data exchange abilities of Windows makes putting together compound documents a snap. We hear tell that the software is now into early beta testing and is ready for a Comdex show-off.

But don't put Cashmere on your Las Vegas schedule. Because sales of the character-based Microsoft Word are currently so good, Microsoft does not want to confuse buyers with a graphical product just yet. Instead, look for an early winter debut.

Ernst & Whinney goes Excel? Rumor has it that this Big Eight accounting firm is looking to make the switch from Supercalc to Microsoft's Excel.

If true, five of the Big Eight bean-counting firms will be using Excel (Arthur Anderson & Co. uses it for some things, Lotus' 1-2-3 for others), putting Excel over the top.

Key reasons accounting firms like graphical spreadsheets? They impress outside clients with hot-looking screens and keep training costs down in this high-turnover field.

Barney is a *Computerworld* senior editor, microcomputing.

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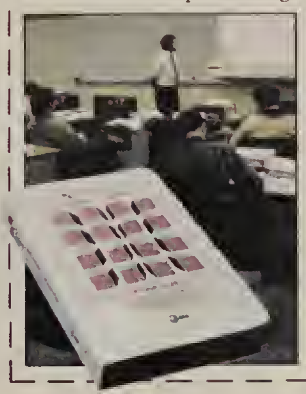

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NEW PRODUCTS

Software applications packages

A product that will serve as a proofreading aid for on-screen text applications has been announced by **CSSL, Inc.** Called **Monologue**, the text-to-speech software will interact with several packages, including Lotus Development Corp.'s 1-2-3, Borland International's Quattro, Ashton-Tate Corp.'s Dbase III and others.

The package contains a separate adapter plug for a parallel port and a set of miniheadphones similar to those found on a portable cassette player. The product is implemented as a terminate-and-stay resident program, and no expansion boards are required, the vendor said.

Monologue costs $189.

CSSL, Suite 202, 909 Electric Ave., Seal Beach, Calif. 90740. 213-493-2471.

A minimal-cost production-scheduling package for IBM Personal Computers and compatibles has been introduced by **Best Way Software Associates.**

Called **Pmodel**, the package was designed to help minimize production, inventory and employment costs for a typical manufacturing company. Program input consists of a company's operational costs, its current status and sales projections for as many as 156 time periods. It is supplied in source code on a 5¼-in. disk and requires a C compiler and 2M bytes of main memory. A math coprocessor is strongly recommended. Pmodel costs $200.

The company also has announced a transportation linear programming package called **Trans.** Originally, the transportation algorithm was used to determine the optimal cost of sending a supply of objects from a number of source locations to another group of destinations. The software can also be used for transshipment and assignment problems, the vendor said.

The program can reportedly read files generated by other systems, and output can be displayed or printed, including solution variables and relative row and column costs.

Trans costs $150.

Best Way Software Associates, P.O. Box 9656, Warwick, R.I. 02889. 401-738-0881.

Battelle has announced a program that assists producers of formulation products. Called **Improveit**, the package reportedly permits users to select the optimal combination of ingredients and process variables to obtain a balance of characteristics.

According to the vendor, it can be used for products such as food, inks, paper, ceramics or any product or process that has controllable input variables and measurable product characteristics.

The software runs on the IBM Personal Computer, PC XT, AT and compatible systems.

Improveit costs $19,800 per company and includes a site license, software support, optimization of a product and related educational activities.

Battelle, 505 King Ave., Columbus, Ohio 43201. 614-424-4160.

A software maintenance management program that runs on IBM Personal Computers and compatibles has been introduced by **Welcom Software Technology. Opmist** was designed for managers who deal not only with routine maintenance tasks but with frequent, sizable expansion or turnaround projects as well.

The product reportedly integrates with a project management system that is based on Welcom's Open Plan software and will handle various duties ranging from generation of emergency work orders to invoking critical-path analysis techniques. Key features include work control capabilities and job plan records.

Opmist costs $9,800 for a single-user system and $24,800 for a four-user system.

Welcom Software, Suite 125, 1325 S. Dairy Ashford Road, Houston, Texas 77077. 713-558-0514.

Instaplan Corp. has announced an expansion product for its computer-assisted planning program. Called **Notepad**, the option will allow Instaplan users to attach extensive notes to each plan activity, resource and work assignment, the vendor said.

A single plan can accommodate more than 3,000 pages of notes, and the outline format documentation includes progress commentary, budget justifications and personnel evaluations.

The basic project planning program from Instaplan costs $99. Notepad costs $70.

Instaplan, Suite 311, Redwood Highway, Mill Valley, Calif. 94941. 800-852-7526.

Corporate Software, Inc., a value-added marketer of personal computer hardware and software, is offering free instant upgrades to Ashton-Tate Corp.'s Dbase IV to customers who purchase Dbase III Plus now.

Customers who buy Dbase III Plus will receive a free upgrade to Dbase IV when it ships, the company said. After Dbase IV ships, upgrades will reportedly cost $175.

Corporate Software, 410 University Ave., Westwood, Mass. 02090. 617-461-1663.

Dac Software, Inc. has upgraded its **Daceasy Accounting** package. **Version 3.0** is said to feature user interfaces with pull-down menus, information export capabilities, new password protection, flat-rate billing and a prompt window.

The release also offers a random-access memory utility and is accompanied by a 460-page manual. The software incorporates seven integrated accounting functions: General Ledger, Accounts Receivable, Accounts Payable, Purchase Order, Inventory, Billing and Forecasting.

Daceasy 3.0 costs $99.95. Current users may upgrade for $35.

Dac Software, Suite 800, 17950 Preston Road, Dallas, Texas 75244. 800-992-7779.

Surplus Risk Services, Inc. has released the **Forerisk Risk Management Information System Software** program.

Targeted at insurance companies, the package was designed to forecast future loss and claim trends based on existing historical claims data. The software offers three modules: Liability, Workers Compensation and Property, and a Claims Audit application is optionally available.

The product requires an IBM Personal Computer or compatible system with a Hercules Computer Technology, Inc. graphics board and 640K bytes of random-access memory.

Surplus Risk Services, Suite N, 3465 Torrance Blvd., Torrance, Calif. 90503. 213-540-8803.

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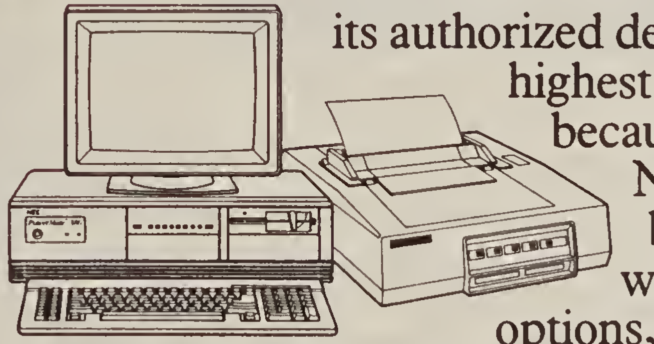

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Software utilities

A memory-resident printer utility that offers what-you-see-is-what-you-get capabilities has been announced by **Data Perceptions Corp.**

According to the vendor, **Laser Preview** displays the document page faster than the printer, thereby allowing page format and text to be checked before printing. The product redirects output from a Hewlett-Packard Co. laser printer or compatible device to a full page preview on any monitor.

Laser Preview is not copy-protected and costs $69.95, plus $3 for shipping and handling.

Data Perceptions, Suite 137, 9842 Hibert St., San Diego, Calif. 92131. 619-455-9500.

Consumers Software, Inc. has announced the **Spreadsheet Toolbox**, a package of six tools designed for use with Lotus Development Corp.'s 1-2-3 and Symphony spreadsheets.

The product incorporates several functions, including a component for retrieving and restoring damaged spreadsheets, a compression and decompression utility and a cell memo facility that allows users to attach notes to spreadsheet cells, file and directory names. The user may also elect to use the Clean Slate tool, a facility that allows the user to bring the spreadsheet back to a clean slate status with all formulas and formats intact but with all entered and calculated data erased.

The Spreadsheet Toolbox costs $99.95.

Consumers Software, 736 Chestnut St., Santa Cruz, Calif. 95060. 800-645-5501.

A utility that simplifies the printing of Lotus Development Corp. 1-2-3 worksheets has been released by the **Pytek Systems Division** of **Lichtman Industries.**

Ez-Print Set is a worksheet file for use with 1-2-3 Release 2.0 or later that allows users to view and change all print settings on a single screen. The product includes instructions and macros to install it in existing worksheets and requires approximately 30K bytes of random-access memory.

The Ez-Print Set costs $26.95.

Lichtman Industries, Lackawanna Plaza, Milburn, N.J. 07041. 201-467-0010.

Macintosh products

Micro CAD/CAM, Inc. has announced its **MGMstation CAD/CAM**, software that was developed for computer-aided design and manufacturing applications on Apple Computer, Inc.'s Macintosh II, SE and Plus.

The software will reportedly enable users to operate CNC-controlled equipment and perform sophisticated functions such as advanced climb-milling for complex pocketing with islands. The product has machining capacity for two-, 2½-, three- and four-axis output and a postprocessing generator for configuring the output for several different machines.

The seven basic modules of MGMstation CAD/CAM software package cost $7,000.

Micro CAD/CAM, 5900 Sepulveda Blvd., Van Nuys, Calif. 91411. 818-376-0008.

Excel Software has announced **Macdesigner 2.0**, a computer-aided software engineering tool designed for professional software developers.

According to the vendor, the program can be used to automate the structured design process or to document existing software systems. Product enhancements reportedly include a global data dictionary and additional support for handling large-structure charts. The software contains six types of windows and a complete set of graphics and text handling functions. An Apple Computer, Inc. Macintosh computer with 1M byte of memory is required for operation.

Macdesign 2.0 costs $795. Telephone support and a periodic newsletter are provided.

Excel Software, P.O. Box 1414, Marshalltown, Iowa 50158. 515-752-5359.

Desktop publishing presentation software designed for the Apple Computer, Inc. Macintosh Plus, SE and II has been introduced by **Manhattan Graphics Corp.** Called **Ready-Set-Show**, the software provides the necessary tools for creating 35mm slides, overhead transparencies, flip charts, speaker's notes and audience handouts.

The product provides extensive color support, including access to the full spectrum of 16.8 million Macintosh II colors.

Ready-Set-Show costs $495.

Manhattan Graphics, 401 Columbus Ave., Valhalla, N.Y. 10595. 914-769-2800.

National Instruments Corp. has released **Version 2.0** of **Labview**, the company's general-purpose tool for data acquisition and analysis that runs on Apple Computer, Inc.'s Macintosh computers.

Continued on page 56

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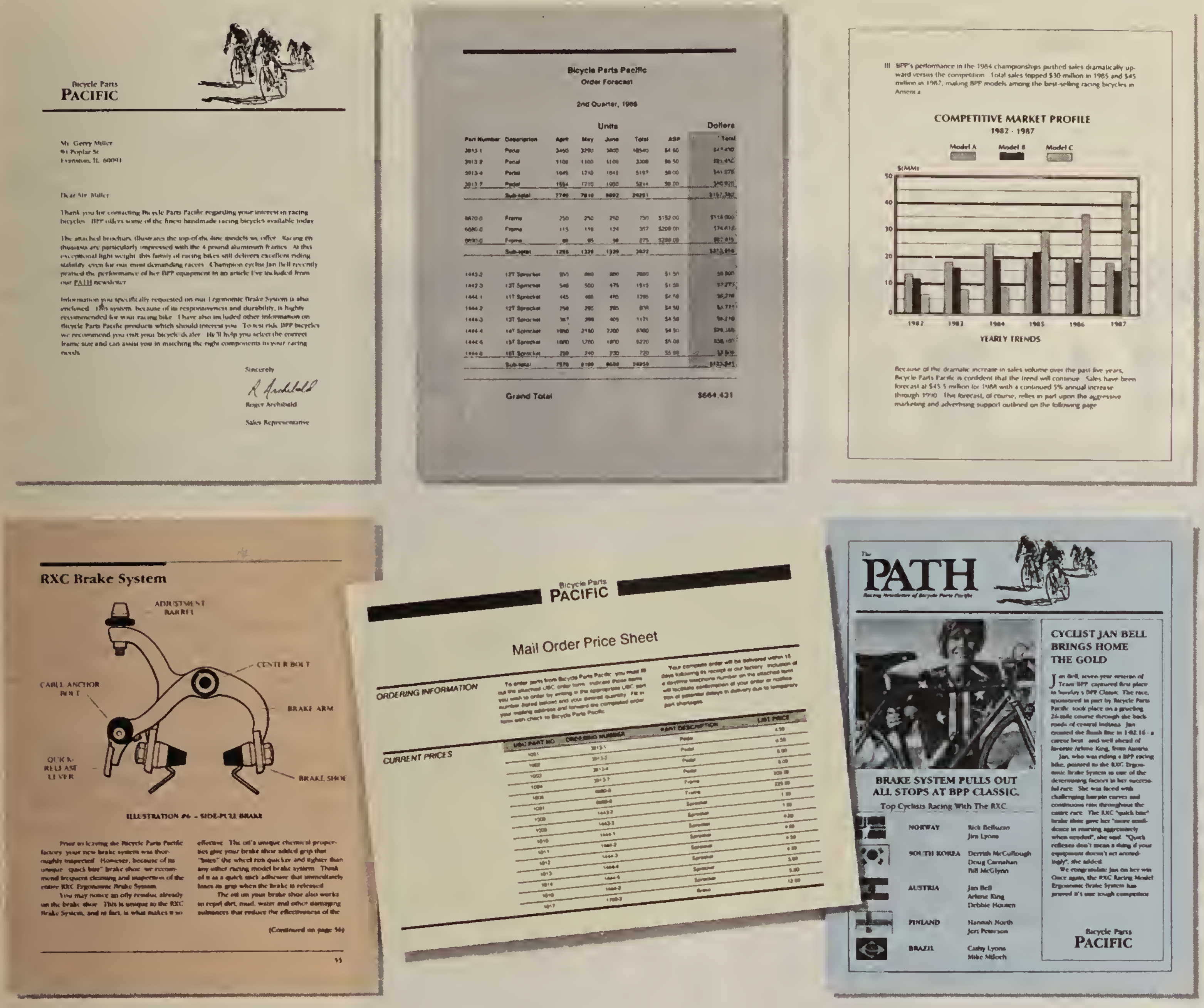
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Print samples were created using Microsoft Word, Microsoft Excel, and Aldus PageMaker.

Continued from page 54

Labview is an icon-based graphical programming system designed to simplify engineering and scientific programming on the Macintosh Plus, SE and II machines.

Features reportedly incorporated into the latest release include front panels for user interface and a compiler that significantly increases execution speed.

Labview costs $1,995. Version 1.2 users may upgrade to Version 2.0 at no charge.

National Instruments, 12109 Technology Blvd., Austin, Texas 78727. 512-250-9119.

An integrated accounting package for users of Apple Computer, Inc.'s Macintosh Plus, SE and II computers is now available from **Softsync, Inc.**

The **Accountant, Inc. Professional** program can be used to track an unlimited number of customers, vendors, inventory items and General Ledger accounts, the vendor said.

Modules include General Ledger, Accounts Payable, Accounts Receivable, Inventory, Payroll, Time Billing, Job Costing and Project Management.

An 800K-byte external drive is required for operation, and the program is Appleshare-, Tops- and Multifinder-compatible.

Accountant, Inc. Professional costs $595.

Softsync, 162 Madison Ave., New York, N.Y. 10016. 212-685-2080.

Development tools

Human Intellect Systems has upgraded **Instant-Expert**, the company's expert-system shell designed for Apple Computer, Inc.'s Macintosh computers.

Release 2.0 of Instant-Expert is said to offer 70% more logic control and features an inference engine that uses both forward and backward chaining. The product supports true, false and unknowns and allows the user to ask "Why?" and "How?" The system runs on Macintosh SE and II computers.

Instant Expert 2.0 costs $498.

Human Intellect Systems, Suite 326, 1670 Amphlett Blvd., San Mateo, Calif. 94402. 415-571-5939.

Visible Systems Corp. has added a prototyping and simulation module to its Visible Analyst Workbench series of computer-aided software engineering tools.

Called the **Visible Prototyper**, the product is a personal computer-based software system that reportedly can be used in the design process to simulate virtually any software, including both mainframe and PC-based target systems. Features include screen design, panel linking and branching, field masking and use of the database for simulation and branching as well as data modification.

The Visible Prototyper may be purchased separately for $595.

Visible Systems, 49 Lexington St., Newton, Mass. 02165. 617-969-4100.

A Cobol/CICS generator has been introduced by **Synoptic Consulting, Inc.**

According to the vendor, **Rapid Automatic Programmaker** is an application generator that was developed in Sweden and has been marketed in Europe for more than a year. The software is said to be menu-driven and includes screen prompting to allow programmers with minimal experience in Cobol/CICS to develop full-fledged Cobol/CICS programs. The product runs on an IBM Personal Computer AT or compatible system with DOS 2.1 or higher. A 10M-byte hard disk is also required.

Synoptic Consulting, 10 E. 39th St., New York, N.Y. 10016. 212-779-1588.

Data storage

A high-speed high-capacity hard disk card for IBM Personal Computers and compatibles and the Tandy Corp. 1000 SX and TX Series is now available from **Origo International.**

The **Model IB49S** has a capacity of 49M bytes and an average access time of 38 msec, the vendor said. It reportedly uses three disks that rotate at 3,600 rpm with six data heads recording on six surfaces. The disks employ 26 sectors per track. The drive can be furnished with hard disk utilities and format and partition software.

The IB49S costs $795.

Origo International, 20675 Bahama St., Chatsworth, Calif. 91311. 818-340-7552.

Overland Data, Inc. has announced a nine-track magnetic tape controller card for IBM Personal System/2 machines.

Designated the **XL/2**, the product allows PS/2 users to read or write nine-track tape from mainframe, minicomputers and microcomputers and is scheduled to ship in October. The card reportedly works with any Pertec/Cipher formatted nine-track transport and costs $1,395. An optional Xenix 386 driver is available for $995.

Overland Data, 5620 Kearny Mesa Road, San Diego, Calif. 92111. 619-571-5555.

Priam Corp. has added 160M- and 250M-byte disk drives to its **Innerspace** family of internal disk (ID) add-in kits.

The **ID160** and **ID250** operate on Intel Corp. 80286 and 80386-based machines as well as the IBM Personal System/2 Models 60 and 80. The ID160 is priced at $2,395; the ID250 is available for $2,895. Several controller options are available.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134. 408-434-9300.

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ZENITH INNOVATES AGAIN—Zenith's collection of AT compatibles began with the Z-386.™ An introduction that ushered in such industry firsts as zero wait states, cache memory and slushware—for greater speed and faster memory access. Once again, Zenith's constant pursuit of innovative, user-relevant technology has created faster, better computers.

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The Z-286 LP comes standard with 1MB RAM—expandable to 6MB without using an expansion slot. Generous memory capacity to run new MS OS/2™ applications. And with a single 3.5" floppy and fast 40MB hard disk you have truly impressive storage capacity.

The Z-248/12 is among the fastest 286 systems available. Its zero wait state design magnifies its 12MHz to speed past 16MHz systems with wait states.

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The Z-248 is also standard with 1MB RAM and is expandable up to 6MB without using an expansion slot. However, four open expansion slots can artfully handle future growth. Configurations of 5.25," 3.5" floppy or 40, 80 and 160MB hard disks truly expand all your options.

All systems are available with Zenith's revolutionary Flat Technology Monitor (shown above) and VGA-compatible video card for ultimate video performance.

With breakthrough after breakthrough, these new computers are yet further proof that Zenith's AT-compatibles define the State of the Art. See the "AT Collection" now showing at your Zenith Data Systems authorized dealer. For your nearest location call: 1-800-553-0350.

ZENITH | data systems

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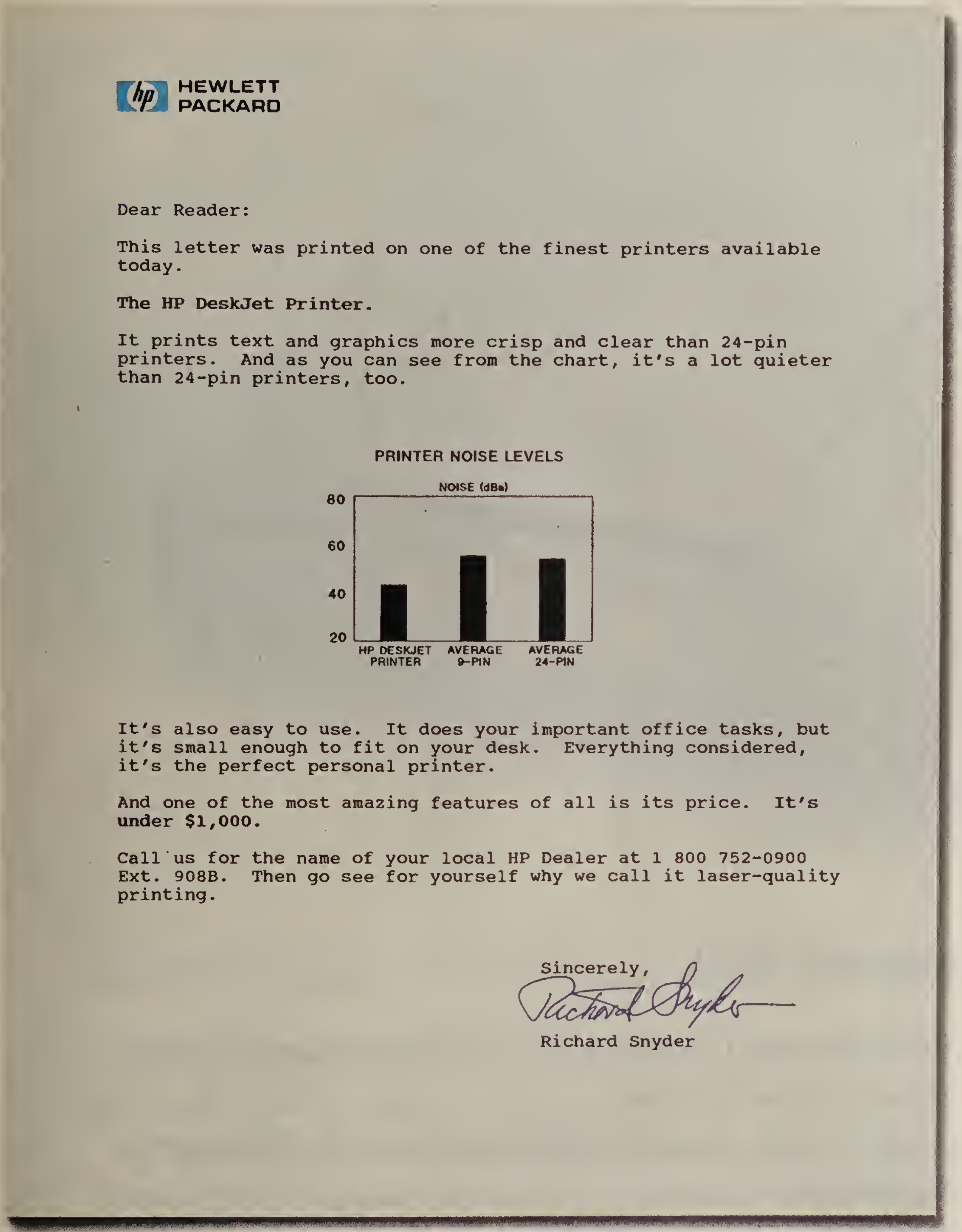

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Richard Snyder

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HEWLETT PACKARD

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Peripherals

Iscan, Inc. has announced **Optimouse**, a pointing device for rapid data entry applications.

The device consists of a miniature real-time digital image processor that will automatically track the position of a lightweight handheld pointer in two dimensions. The pointer position may be directly interfaced to any computer for control of cursor position on its video terminal.

Optimouse costs $2,800 in single quantities. Volume discounts are also available.

Iscan, 125 Cambridgepark Drive, Cambridge, Mass. 02238. 617-868-5353.

A set of printer control functions for the Hewlett-Packard Co. Laserjet and compatible output devices are available from **The Mayflower Consulting Group.**

The **Laser Library** was designed for Nantucket Corp. Clipper programmers and offers various features including graphics routines, advanced font routines, printer control, form file generation and multiple paper size capacity, the vendor said.

The product is compatible with Clipper Autumn 86 and Clipper Summer 87. DOS Version 2.0 or higher is required.

The Laser Library costs $49.95, plus $3 for shipping and handling.

The Mayflower Consulting Group, 131 Middlesex Tnpk., Burlington, Mass. 01803. 617-270-9000.

Dataproducts Corp. has introduced enhanced versions of its **IM 300/315** and **IM 600/615** line matrix printers. Updated features reportedly include Printronix, Inc. P-Series emulation, improved print bar design and extended verifiability of ribbons. The printers also offer support for Hewlett-Packard Co.'s Printer Control Language.

According to the company, the IM series prints text, block characters, graphics and bar codes. The devices also handle multipart forms and are capable of generating condensed or expanded character size, different type styles and varying pitch.

The IM 300 is a tabletop unit that prints up to 420 line/min. The IM 600 prints up to 840 line/min and is housed in a full cabinet. Both the IM 315 and IM 615 models include quiet full cabinets that have a reported rating of 55 dba. Pricing starts at $5,795.

Dataproducts, P.O. Box 746, Woodland Hills, Calif. 91365. 818-887-8000.

Board-level devices

A four-channel analog-output interface board for the IBM Personal System/2 Models 50, 60 and 80 has been introduced by **Metrabyte Corp.** The unit is especially suited for applications such as process-loop interface, limit-switch sensing and driving external devices, the vendor said.

Called the **UCDDA-04**, the board reportedly provides 24 parallel digital I/O lines configured as two eight-bit ports and two four-bit ports. The Intel Corp. 8255 Interface Chip is used for the digital I/O section, and the full operating instruction set is supported. All digital I/O lines are CMOS compatible.

The UCDDA-04 costs $699.

Metrabyte, 440 Myles Standish Blvd., Taunton, Mass. 02780. 508-880-3000.

Zymacom, Inc. has announced **AVA**, an automated voice administrator board for IBM Personal Computer XTs, ATs and compatibles.

The board's Automated Attendant module features unattended answering and routing of incoming calls, unattended directory assistance and an automated transfer to an operator-on-demand feature. Voice-messaging modules are also available. The product can reportedly be configured with a variety of disks, and the software modules can be customized for almost any specific business need.

AVA costs $1,100.

Zymacom, 2 Liberty Way, Westford, Mass. 01886. 508-692-4500.

Wang Laboratories, Inc. has introduced a security product for its commercial PC 200 and PC 300 series of IBM Personal Computer AT-compatible systems.

Called **Microcontrol**, the product reportedly protects personal computers in stand-alone, networked and workstation environments. Through a licensing agreement between Wang and Micronyx, Inc. in Richardson, Texas, the product combines Micronyx file-encryption technology with Wang's diagnostic routines. The system is primarily suited for financial services; federal, state and local governments; insurance; law enforcement; and aerospace and defense organizations.

The product consists of an expansion board, personal identification tokens with a token receptacle and supporting menu-driven software utilities.

Microcontrol costs $1,200.

Wang, One Industrial Ave., Lowell, Mass. 01851. 508-459-5000.

Northbank Corp. has developed a hardware device to help prevent the spread of viruses as well as prevent a virus from destroying or damaging a user's disk files.

Called **Guard Card**, the product is a half-size card that plugs into an IBM Personal Computer or PC AT compatible. When activated, the card prevents write access to predefined areas of the disk. An alarm sounds whenever an attempt is made to write to the protected area, the company said.

Guard Card costs $194.

Northbank, 10811 Northbank Road, Richmond, Va. 23233. 804-741-7591.

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NETWORKING

DATA STREAM

Tony Friscia

MAP standard still in flux

Events at the recent MAP/TOP Users Group gathering showed that the MAP protocol — as well as the vendor and user organizations that back it as a standard — are still in a state of flux.

During the meeting, the users group announced that, effective Jan. 1, 1989, its U.S. and Canadian branches expect to merge to form a single North American organization. This new group will operate as a division of the new Information Technology Requirements Council (ITRC).

The ITRC's focus extends beyond communications. Its charter is to "promote consensus, integration and coordination across the entire range of information technologies," including networking, application interfaces, languages, operating systems and database management systems.

Advanced Manufacturing Research (AMR) is cautiously optimistic about the ITRC's goals. Initial reports have it focusing on critical user concerns — making a business case for MAP/TOP and implementation

Continued on page 72

Retix, Touch target end users

Sensing increased user interest, OSI leaders unveil network software

BY PATRICIA KEEFE
CW STAFF

Retix Corp. and Touch Communications, Inc. — two leading suppliers of Open Systems Interconnect (OSI) software to OEMs — unveiled plans to enter the end-user market next year, a sign that user interest may be catching up with OSI hype.

Steady growth in electronic mail systems in general, with strong worldwide interest in the CCITT X.400 messaging standard in particular, have prompted Retix to introduce Retixmail and the Open Server 400 message server.

Currently in Alpha testing, the X.400-compliant mail products are scheduled to ship in the first quarter next year.

According to Retix President Andy De Mari, that is about when the OSI market will begin to really take off. He suggests users will begin implementing OSI technology as productive "islands" next year and continuing through 1991. Corporate-wide deployment will begin in 1992. "X.400 capabilities are most needed now," he said.

The vendor claimed that Retixmail, which will be sold to end users, is the first native-mode X.400 E-mail system to feature a graphical interface. Another key feature is Retixmail's ability to interface with any E-mail front end or server via Open Server 400's application programming interface, De Mari said.

Mail call

Personal computer users reportedly can use the store-and-forward Retixmail system to transfer messages and files between PCs on the same local-area network and with additional LANs via private lines or X.25 public network connections.

Remote links can be made with minicomputer or mainframe E-mail services that support the rapidly emerging X.400 standard, Retix said.

Retixmail will appear to users as a Microsoft Corp. Windows application. Each user-agent PC communicates via an existing LAN with a PC outfitted with the Open Server 400 message server package. That package consists of Message Transfer Agent software and a wide-area network (WAN) coprocessor board that handles OSI WAN in the lower layers. A single-application version of Windows is included with the user-agent software.

The Microsoft MS-DOS-based Open Server 400 is said to be the heart of Retixmail and

Continued on page 72

New Fujitsu group leaps into T1 race

BY ELISABETH HORWITT
CW STAFF

SAN DIEGO — A cutthroat and overcrowded T1 switch market gained yet another contender recently, when Fujitsu America, Inc. formed a division to sell private networking systems and consulting in the U.S.

At the time of its formation, Fujitsu's Private Network Division announced a switch that reportedly is capable of supporting up to 16 T1 links: it also introduced a network management system and network consulting services.

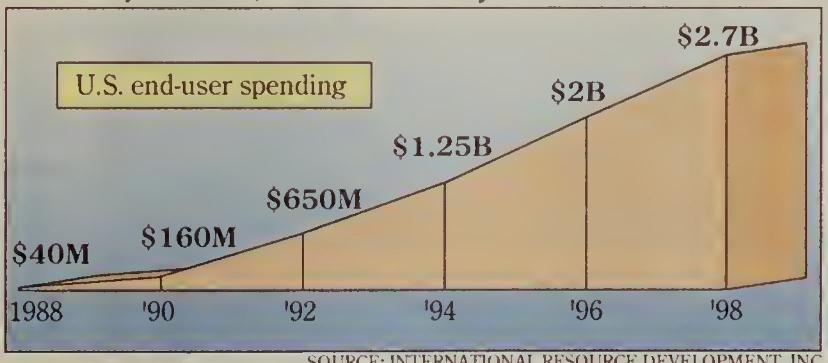
The Private Network Division may have a tough time breaking into the crowded mar-

Continued on page 62

Data View

T3 equipment and services projection

Sales for 45M bit/sec. links should skyrocket in the next decade



SOURCE: INTERNATIONAL RESOURCE DEVELOPMENT, INC.
CW CHART

Softswitch revs gateways

BY PATRICIA KEEFE
CW STAFF

WAYNE, Pa. — A very busy Softswitch, Inc. has spent the last month rolling out four products, three of them involving support for IBM Systems Network Architecture Distributed Services (SNADS).

The gatemaker enhanced its SNADS gateways for IBM's MVS and Digital Equipment Corp.'s VM operating systems.

The upgrades enable both links to interoperate with the SNADs capabilities of IBM's Application

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Inside

- 3Com diskless workstation does math. Page 62.
- Falling MAP card prices. Page 66.
- UB out with eight-port terminal. Page 78.

Tenneco gets timely DEC-IBM link

BY ELISABETH HORWITT
CW STAFF

HOUSTON — A company on the block rarely has a lot of time and money to spend on new networking applications. Lucky for Tenneco Oil Co., it had already selected and tested its DEC-to-IBM connectivity system before parent Tenneco Corp. had gotten very far in the process of selling it off.

Based on gateways connecting Digital Equipment Corp. Decnet to IBM Systems Network Architecture (SNA) and communications software from Joiner Associates, Inc., the system provides electronic mail and file exchange among DEC and IBM users throughout the former Tenneco Corp. subsidiary.

IBM MVS mainframes support business and financial applications at Tenneco Oil's Houston headquarters. Divisional offices use both DEC VAX/VMS and IBM VM computers: They use VAXs for oil exploration and production applications and the VM systems for divisional financial operations, some data storage and some exploration software, according to Tenneco Oil program analyst Leslie Keller.

Divisional DEC users occasionally need to access IBM databases and vice versa; additionally, users throughout the company need to communicate via E-mail.

When Keller joined Tenneco Oil about a year ago, the company had already installed Decnet-to-SNA gateways to physically link the two vendors' hosts. However, the systems group still needed to find software that made the connection easier and more transparent to users.

After an initial evaluation period late last year, the group chose Joiner's Jnet, VAX software that provides file exchange between DEC and IBM systems, as well as message exchange between the two vendors' respective E-mail products.

This latter capability has been a big boon for Tenneco Oil employees, who either use VAX/VMS Mail or IBM's Professional Office System (Profs), Keller said.

Keller said he has personally found the link useful: While he does 99% of his work on a VAX, his boss is an IBM VM user. Prior to Jnet, Keller had to invoke an IBM 3270 emulation package and log onto Profs just to find out whether he had any messages from his boss or anyone else in the IBM systems group. Now, Jnet automatically forwards Keller's Profs mail to his VAX/VMS Mail queue.

Better communications

The link has increased communications significantly between the IBM and DEC sides of the company, Keller claimed. It is also used extensively for file transfer. For instance, users running exploration software on a VAX often need to access oil-well logs that are stored on an MVS mainframe.

Instead of going through a complicated log-on procedure, users can invoke Jnet. The software will ask what type of information is needed and then request it from the MVS host using IBM JCL.

One of the few difficulties the company has run into in the DEC-IBM connectivity area is providing a way for IBM users to log onto DEC systems, Keller said. DEC users can log onto IBM mainframes through a 3270 terminal emulation package sold by DEC. But it took awhile to find an ASCII board that allows IBM users to log onto a VAX via an IBM 3174 controller.

However, this was an important capability, particularly for the company's San Antonio office. Having already bought approximately 100 terminals for its IBM VM host, the division did not want to buy another 100 DEC terminals, Keller said.

Now that Tenneco Oil has been sold, it probably will not be able to buy any more of these useful little ASCII cards — at least for a while, Keller said. Fortunately, the products already in place should support the company's DEC-to-IBM connectivity needs for some time to come.

3Com graphics assail PS/2

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — 3Com Corp. has enhanced its diskless workstation with a math coprocessor and high-resolution IBM Video Graphics Array (VGA) graphics that it claimed exceed IBM's Personal System/2's graphical capabilities.

The restructured workstation is targeted at the increasing number of users who are implementing more sophisticated graphics- and computation-intensive applications such as desktop publishing, financial spreadsheets and computer-aided design.

3Station/2E is an Intel Corp. 80286-based, IBM-compatible Ethernet workstation designed for use on a network running 3Com's 3+ or 3+Open network operating systems.

Holding the fort

Medialess workstations tend to be used on networks that either require a high degree of security or operate on a low cost threshold. 3Station enhancements will allow 3Com to maintain its strong position in this high-growth market, according to Greg Blatnik, an analyst at Dataquest, Inc.

"MIS managers will appreciate the centralized control the 3Station/2E offers while users will appreciate the very fast, high-quality graphics," added Ellen O'Brien, a senior analyst at Framingham, Mass.-based research firm International Data Corp.

3Station/2E features IBM VGA in both standard mode (640 by 480 pixels by 16-color graphics array) and high-resolution mode (800 by 600 pixels by 16-color graphics array). A 132-col text option reportedly enables the spreadsheet user to see 65% more entry columns than would a standard workstation.

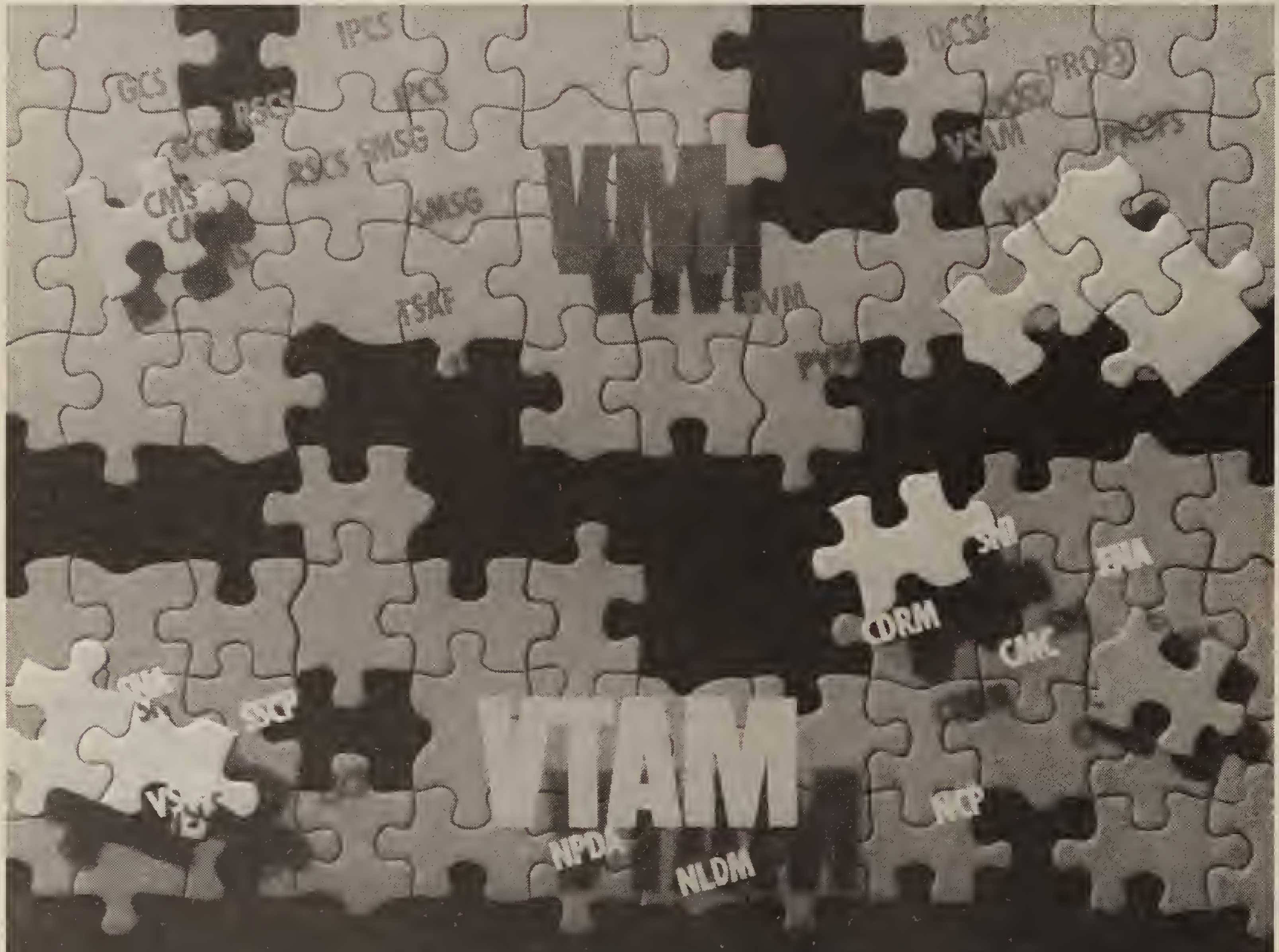
3Com claimed the product not only beats PS/2 graphics but supports graphics-intensive applications such as Microsoft Corp.'s Windows/286, Autodesk, Inc.'s Autocad, Lotus Development Corp.'s 1-2-3 and Xerox Corp.'s Ventura Publisher software.

Faster numbers

A second key enhancement is the ability to accommodate Intel's 80287 math coprocessor to handle the faster numerics processing required in computer-aided design applications and some financial applications.

The workstation also features 1M byte of base memory with optional expansion to 3M or 5M bytes, a built-in Ethernet connection and a compact design.

The 3Station/2E replaces its predecessor, the 3Station, and is slated to be available next month with a price tag of $2,495.



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Fujitsu

CONTINUED FROM PAGE 61

ket, according to Michel Guite, a vice-president at Salomon Brothers, Inc. "It's a hard time to come in, even for the most distinguished high-end companies," he said.

In order to have some chance of success, companies need to provide voice/data links across an integrated network of both 1.5M bit/sec. T1 links and 45M bit/sec. T3 trunks, Guite added.

Another important criterion for success would be alliances with pivotal industry players such as the big computer companies, Guite said. "There is not much room in the market for a stand-alone unit — even a high-quality, high-end one." Vendors such as Network Equipment Technologies, Inc. and Digital Communications Associates, Inc. "already have the high-end market staked out," Guite said. Technology is less an issue now than a broad, well-established customer base, he noted.

Bases loaded

Fujitsu's new division hopes to leverage parent company Fujitsu Ltd.'s technical expertise and customer base in its assault on the U.S. T1 market, the company said. During the past four years, Fujitsu Ltd. has installed more than 380 voice/data/image/video backbone networks for major companies in Japan and elsewhere, the vendor said.

At the time of its formation, the division announced Digital Multimedia Information Exchange (DMIX), a T1 network switch said to support voice, data, image and video transmissions. It reportedly provides automatic dynamic rerouting of traffic around faults, multidrop capabilities and integrated voice compression at rates of 32K, 16K and 8K bit/sec.

A DMIX network can support up to 256 nodes, each node supporting up to 16 T1 trunks, Fujitsu said. It will be migrated to Integrated Services Digital Network at an undisclosed point in the future.

Also introduced by the newly formed division was a network management system based on a Sun Microsystems, Inc. workstation. It is said to provide network monitoring, configuration and performance management down to the DMIX card level. Both the switch and network management system are scheduled to be available in the first quarter of next year.

Fujitsu will immediately start offering network consulting services, including analysis, audit, design and implementation, the company said.

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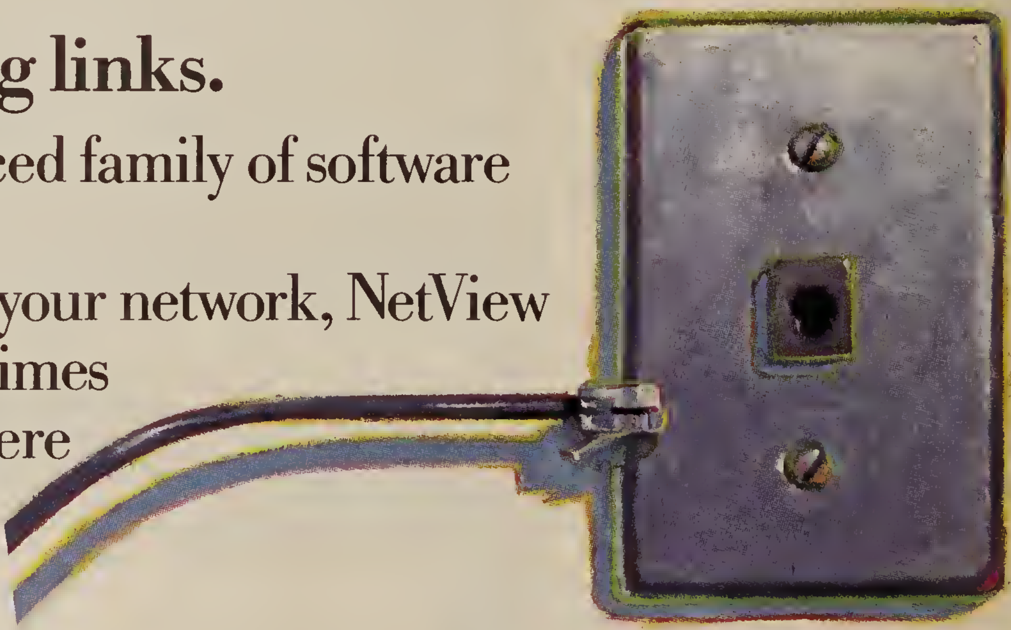

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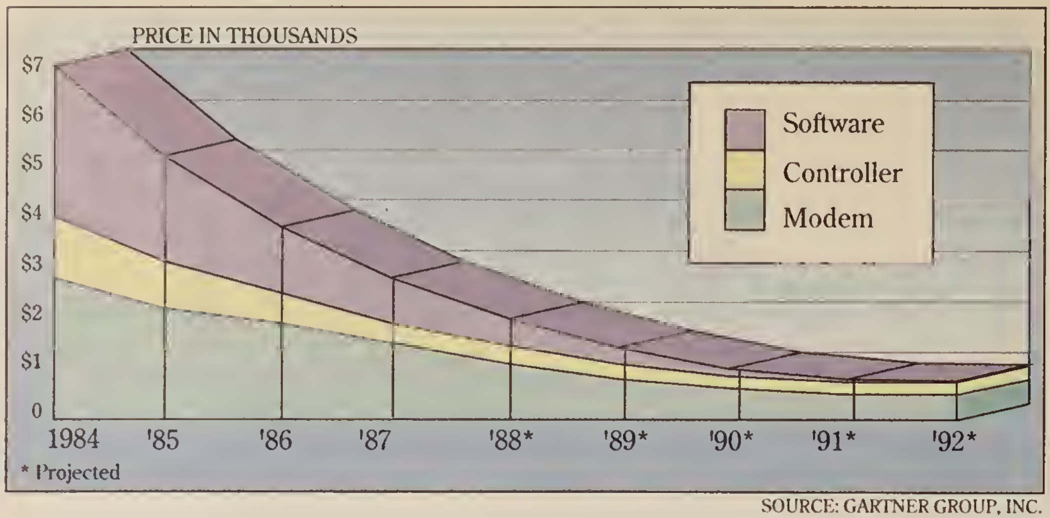
IBM The Bigger Picture

MAP card costs to come down

BY PATRICIA KEEFE
CW STAFF

MAP card costs dropping

Reduced prices, particularly for the software component, are expected to spur sales



SOURCE: GARTNER GROUP, INC.
CW CHART

STAMFORD, Conn. — The cost of networking cards based on the Manufacturing Automation Protocol (MAP) should drop to less than $1,000 per card by 1990, according to a recent study by the Gartner Group, Inc.

Although the cost per card makes up just a small percentage of a total plant floor network, that high cost has represented a significant psychological barrier to the purchase and implementation of MAP networks, slowing sales of the technology, according to Gartner.

A key factor slowing the adoption of MAP in factory communications has been the $2,000 to $7,000 price of network adapters, according to T. Lee Wylie, Gartner's vice-president of the Computer-Integrated Manufacturing Service.

While card costs have seen steady drops — and in previous years, dramatic reductions (see chart) — many users compare the cost of a MAP card with an RS-232C or other low-cost communications card. "This type of comparison invariably causes the user to reject MAP on the grounds of simple costs," Wylie said. He said a more reasonable cost goal for users was $1,000 per card for broadband and $500 for carrierband technology.

The price drop should open the market for manufacturing-oriented Open Systems Interconnect-based products to take off in the early 1990s, he predicted.

Three groups

Gartner breaks the cost of a networking card into three components: controller, modem and software embedded in read-only memory, or firmware.

The software portion of the card represents the most dramatic potential for cost reductions, since these costs represent an allocation of fixed development costs, according to Wylie. So far, few of these costs have been amortized. "With stabilizing standards such as MAP 3.0, the price of firmware chip sets should approach the cost of clone PC BIOS chip sets in the next few years."

Volume increases in controller card sales will let manufacturers absorb development and fixed factory costs more quickly. "Most significant, anticipated volume will let MAP network vendors optimize the product design and take advantage of surface-mount technology and increasing levels of custom logic to reduce chip costs," Wylie said.

AT&T releases Accunet option specifications

AT&T has released equipment interface specifications for a possible new networking option that would provide users with end-to-end control of their Accunet bandwidth, the vendor said.

The option would allow users to reconfigure AT&T Accunet T1.5 Service connections between AT&T switching sites and their own premises, an AT&T spokeswoman said.

This capability would be provided as part of the company's existing Bandwidth Management Services, which currently allow customers to reconfigure Accunet bandwidth between AT&T service points but not over the local loop.

The release of interface specifications indicates that AT&T might make these enhancements commercial, but it does not guarantee it, the AT&T spokeswoman said.

AT&T is required by law to release specifications ahead of time, so that equipment vendors can build interfaces between their networking products and a possible future service.

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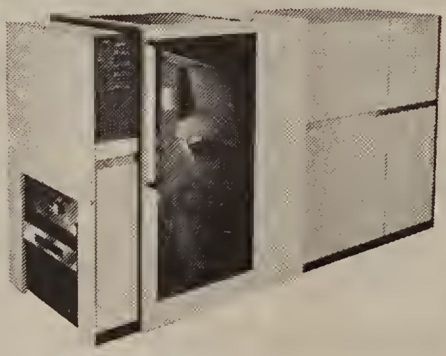

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ISDN not big in Fortune 1,000

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Despite the proliferation of field trials and the formation of a users group to put application needs in priority order, Integrated Services Digital Network (ISDN) faces limited penetration of the Fortune 1,000 in the next five years, according to Forrester Research, Inc.

Though installations of Basic Rate Interface (BRI) lines should grow to more than 1.5 million by 1993, they will represent a mere 8% of total Fortune 1,000 end-user connections, Forrester projected in a recent research bulletin. Primary Rate Interface (PRI) lines will account for just 5% of trunks in the same period.

The influx of 5ESS switches into the central office is expected to fuel the BRI's access to the corporate market in the short term. As the regional holding companies move their equipment base from analog to digital services, they are likely to discount BRI lines to early implementors in order to build ISDN demand and garner market share, according to Mary Modahl, a Forrester analyst.

The way carriers price ISDN services will be critical in what promises to be a competitive, price-sensitive market, analyst H. Paris Burstyn wrote in Boston-based Business Research Group's September newsletter. Product availability and applications make up the remainder of a three-pronged barrier facing ISDN purveyors, he added.

"In view of the wide range of vendors that can offer ISDN and similar services, we believe that regulators will allow carriers to implement increasingly flexible pricing strategies, just as they have with Centrex," Burstyn wrote.

'Poor man's T1'

Early users will consist of Fortune 50 technology leaders and those with intensive incoming telemarketing programs, Forrester said. There is potential for limited demand for PRI as a "poor man's T1" among some mid-size firms, or those with $500 million in revenue, Modahl predicted.

"In the next few years, we'll see a move to digital service among Centrex users," she added. Not only is digital cheaper, but it will allow users to upgrade to ISDN when the time is right, she said. In the meantime, she said, she expects private branch exchange users to sit tight.

As a result, the market research firm is predicting that Centrex-based BRI will be the fastest growing segment through 1991. However, toward the mid-1990s, a fourth generation of PBXs with PRI ports will heat up PBX-based BRI sales, she added.

PRI installations will grow more slowly, thanks to competition from private network implementations in the Fortune 1,000. Large companies are unwilling to relinquish the control that T1 and T3 systems give them over proprietary data flows and voice communications, Modahl said. Tariffed PRI is also 20% to 30% more expensive than the alternatives.

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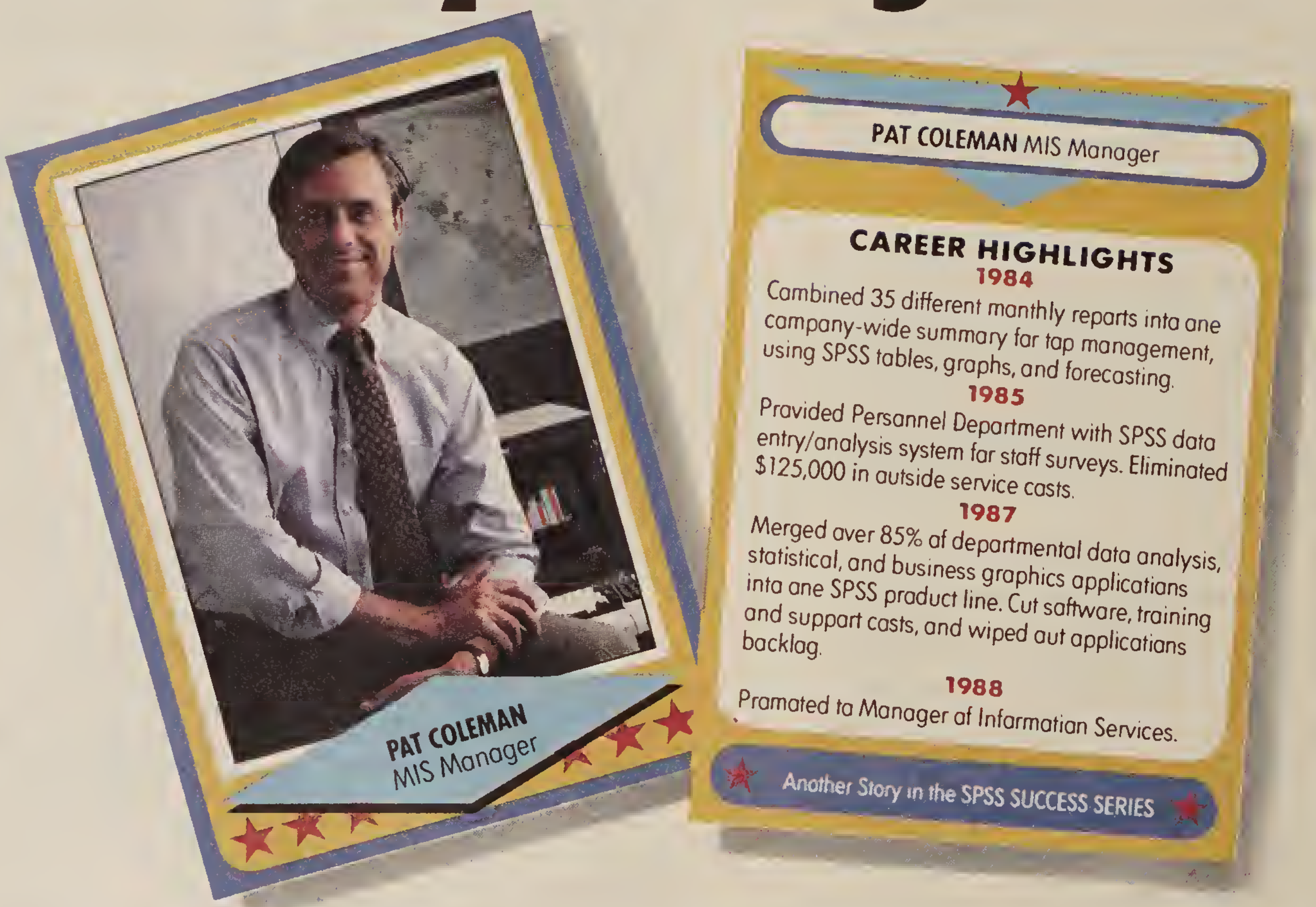

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Softswitch

FROM PAGE 61

System/400 and Data General Corp.'s CEO system. Enhanced gateway pricing ranges from $21,600 to $96,000, depending on configuration.

SNADS is IBM's protocol for store-and-forward communications and is supported by many office systems vendors for interconnection of electronic mail in an SNA environment.

Other announcements

Separately, the vendor released a SNADS link to Banyan Systems, Inc.'s Banyan Mail. When used in conjunction with other Softswitch products, SNADS Gateway/Banyan Mail is said to allow the exchange of E-mail between Banyan Mail and most other major mail systems, such as IBM's Distributed Office Support System.

The gateway appears to Banyan's Mail system as a Banyan Street Talk group/organization and to the IBM network as a SNADS Distribution Services Unit. The gateway license is priced between $995 and $2,660 per local-area network, depending on volume and the level of revisable document support required.

The SNADS protocol is considered by some to complement CCITT's message handling standard, X.400. Softswitch said it will ship an X.400 gateway in the first quarter of 1989.

Softswitch also unveiled new releases of its Mailbridge Server products for the DEC, Hewlett-Packard Co. and Wang Laboratories, Inc. environments. All releases now support binary file transfer:

- Mailbridge Server/DEC reportedly executes in a DEC VAX as a Digital Message Router user agent, communicating with DEC's All-In-1 and VMSmail and Softswitch products in other environments. It now supports DEC cluster naming.
- Mailbridge Server/HP Desk executes in an HP 3000 and uses HP's Foreign Service Connection. Major enhancements include SNA communications support and support for exchanging documents created with HPWord or AdvanceWrite.
- Mailbridge Server/Wang Office executes on a Wang VS, using Wang's Office applications program interface. It now provides increased administrative capability.

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Friscia

CONTINUED FROM PAGE 61

issues. The broader information technologies outlook is extremely important because communications is only one component of multivendor and enterprise integration. The caveat is the speed at which the ITRC can be fully operational.

Ideally, the ITRC will become the catalyst for user input into work under way at existing groups such as the Corporation for Open Systems, the Open Software Foundation and the National Center for Manufacturing Sciences.

The most talked-about event of the MAP meeting was Ungermann-Bass' announcement that it will support the MAP 3.0 protocol stack, services and applications on top of IEEE 802.3 and 802.5 but will freeze its token-bus (802.4) products at Release 2.1.

User reaction was mixed. Several were very positive. Many have a mix of baseband and fiber networks and welcome the availability of MAP services over these networks.

Some of UB's Industrial Networking, Inc. (INI) customers, however, voiced concern about the absence of a "second source to Concord Communications" and the lack of an upgrade path from UB's token-bus-based MAP 2.1 products to Release 3.0. These users claimed they have been abandoned. INI was a joint venture between UB and General Electric Co. and has since been absorbed into UB.

The announcement prompts several questions:

- Why is UB phasing itself out of the 802.4 product market?
- Is there an advantage to putting the Manufacturing Messaging Standard (MMS) and other upper layer MAP services on top of non-802.4 media?
- Can UB provide upper layer MAP services over 802.3 or 802.5 and use the MAP name?

The reason behind UB's decision is pure economics. The 3.0 product set requires a total hardware and software redesign; it is not compatible with 2.1. UB's market forecast reveals that the current 802.4 demand does not justify the level of investment required. UB said this decision is "not irreversible." In essence, it is building a protocol engine that is media- and access method-independent.

Further, UB's decision to support 3.0 over 802.3, or Ethernet, is in sync with AMR research, which shows that more than 60% of industrial backbone networks are Ethernet-based. DEC's Decnet alone counts for almost 50% of the manufacturing networking market. AMR expects Ethernet to continue to set the pace in industrial network sales.

Industrial-strength OSI

Whether UB labels as MAP its products running MMS over an Open Systems Interconnect (OSI) network over 802.3 is not important. Interviews with users indicate a strong demand for OSI networks in industrial applications. OSI without the MAP upper layers (specifically MMS) is useful in manufacturing. Given user demand, UB will address this need, independent of the use of the MAP name.

UB's strategy is not intended to hurt the MAP effort but rather to profitably address its customers' requirements. In the past two years, UB has shipped more Ethernet into the factory — at more than a 5-to-1 ratio — than token-bus. At the same time, the company invested more than $20 million in token-bus development, which has represented little more than a drain on its profits.

Friscia is president of Advanced Manufacturing Research, a Salem, Mass.-based research and consulting firm.

Retix, Touch

CONTINUED FROM PAGE 61

will be marketed as a standard X.400 network access platform to third-party application developers and OEMs. An applications program interface will be made available to third parties without licensing fees, according to Retix.

Unix- and OS/2-based versions of Open Server 400 are slated for the second and third quarter, respectively.

A typical Retixmail system supporting 100 user agents and multiple WAN connections from one server is priced at approximately $7,000. That includes a coprocessor, Open Server and a front end on the user station.

Retix competitor Touch Communications, Inc. introduced a family of Technical Office Protocol 3.0-based end-user networking software said to support three office computing platforms: Apple Computer, Inc.'s Macintosh, IBM's Personal Computer and Digital Equipment Corp.'s VAX/VMS family. These products are slated to ship in November.

OSI network services include file, print, terminal and security. Users reportedly can run popular off-the-shelf applications on PCs and Macs while using the VAX as a file and print server.

Touch claimed it is the first vendor to offer an end-user OSI product for the Macintosh. Apple has a 10% investment in Touch. Its Touch OSI product family also interoperates with implementations of the Government OSI Profile and the Manufacturing Automation Protocol.

Pricing is as follows: Touch OSI Macintosh software is $395 or, bundled with a network controller hardware, $940; Touch OSI DOS software costs $395 or $1,340 bundled with network controller hardware; and Touch OSI VMS pricing starts at $3,000 for a five-user license.

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BIT BLAST

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Bellsouth Corp. reportedly has become the first local carrier to officially introduce a gateway service that links users' workstations to multiple information services via one telephone number. The Transtext Universal Gateway routes user transmissions to local or national information services through their existing local telephone lines, according to Bellsouth. Currently, the firm uses a menu-driven system. The company is initially testing the market for the service in the Atlanta calling area.

Communications Solutions, Inc. in San Jose, Calif., has published several reports on IBM communications and software products, such as LU6.2 and PU2.1, as well as on IBM's overall communications and software strategy. "IBM's Integrated Office Strategy: Connectivity and Performance for the 1990s" is a 131-page document with a price per copy of $345. "Systems Application Architecture: The Future of IBM Connectivity" is a 165-page document that is priced at $395. And the 141-page study, "Introduction to Advanced Program-to-Program Communications," also costs $395.

Intelco Corp., a supplier of test instruments for telecommunications, is offering "Users Share Responsibility for Maintaining T1/Fiber Network." The free, five-page article reportedly provides a detailed technical discussion of available testing methods for identifying problems in a T1 transmission system. A glossary of T1 terms is included. More information is available by calling 508-264-4485.

Shiva Corp. is shipping Netbridge, a local bridge for Apple Computer, Inc. Appletalk networks. Netbridge alleviates congestion by creating a larger internetwork with doubled node and wiring lengths.

Omnitel, Inc., a supplier of communications products, has begun shipping its Asynchronous Gateway Starter kit at a 25% discount as part of a campaign to introduce end users to personal computer local-area network gateways. The product reportedly enables LAN users to access remote systems and databases. The kit comes in three versions, with pricing ranging from $1,346 to $2,396. Suggested list price will result in an average 25% discount.

Guilbert Associates, Inc. and **P. Lemme & Associates, Inc.** in Washington, D.C., will jointly offer two-day training sessions on the development of electronic data interchange (EDI) applications. Geared to both technical and nontechnical managers, the sessions were designed to help organizations analyze how to use EDI in terms of cost/benefits, strategic implications and product selection. Registration will be $55 per person. For details, call Guilbert Associates, 202-785-4365.

The Telecommunications Users Group has announced the publication of its "Beginner's Guide to Computer Telecommunications." The 30-page guide discusses a variety of subjects such as how data is stored in a computer, cables between computer and modem, different types of modems and logging onto computer bulletin boards. It includes a telecommunications glossary. The guide is available by mail and costs $8, plus $2 for handling. Contact: Beginner's Guide, TUG, Box 45254, Seattle, Wash. 98145.

Catherine's, Inc. has signed a five-year agreement with **GE Information Services** to move Catherine's data networking applications onto the General Electric Co. division's public data network. GE Information Services is working on a credit system for Catherine's and will also provide and manage links between the clothing retailer's headquarters and 214 stores across 35 states.

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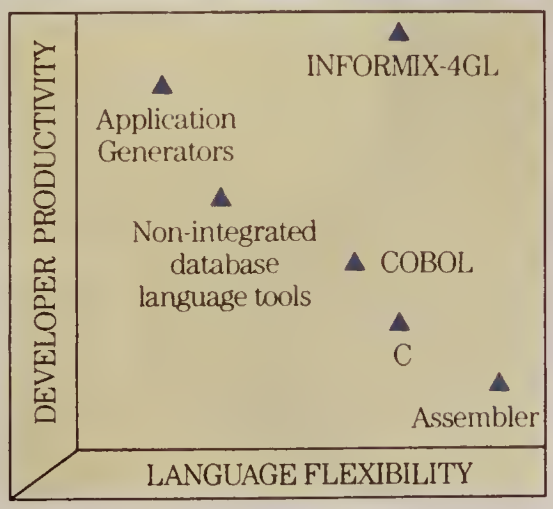

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NEW PRODUCTS

Local-area networking hardware

Ungermann-Bass, Inc. has upgraded its asynchronous terminal server product line with the addition of **Net/One NIU-190** — an eight-port terminal designed to support Transmission Control Protocol/Internet Protocol and Xerox Network Systems protocols.

The product includes 512K bytes of random-access memory and offers higher data throughput and greater packet-buffering capabilities than previously offered products, the company said. The unit is available in baseband and broadband models and can operate in multimedia environments. Users may access up to three logical sessions concurrently through a single port.

Net/One NIU-190 costs $2,995.

UB, 3900 Freedom Circle, Santa Clara, Calif. 95054. 408-496-0111.

Pure Data Ltd. has announced a multistation access unit that was designed for the IBM Token-Ring network.

Called **PDCTRN**, the device includes diagnostic LEDs for monitoring network activity.

The product includes eight Token-Ring ports and will optically isolate the workstation from the hub with no electrical connection required.

PDCTRN costs $995.

The company also introduced an Ethernet card for the Toshiba Corp. portable personal computers, including the Models T5100, T3100, T1200 and T1100 Plus.

PDT8023 installs in the PC's expansion slot and reportedly conforms to the IEEE 802.3 standard. The product has no dip switches and is accompanied by a diskette that provides configuration and added network diagnostic utilities, the vendor said.

PDT8023 costs $595.

Pure Data Ltd., Suite 140, 1740 S. I-35, Carrollton, Texas 75006. 214-242-2040.

UDS can stand the heat in the V.32 kitchen

The Canadian Standards Association literally put our modem to the torch. The UDS V.32 in this photo suffered considerable cosmetic distress, but as bad as the unretouched damage looks, the modem still handles data normally. For more details on V.32s that can take anything you throw at them, contact:

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Local-area networking software

Columbia University has released a new version of the Kermit communications package.

MS-DOS Kermit 2.31 was designed to run on IBM Personal Computers and compatible Microsoft Corp. MS-DOS-based systems and is not copy-protected or licensed, the developer said.

Features include an enhanced script language facility, error-checked file transfer and management and terminal emulation capabilities. It can transfer files at rates up to 56.7K bit/sec. using any PC asynchronous communication port and can also operate over IBM Netbios-based and other local-area networks.

MS-DOS Kermit 2.31 costs $20 and is available in either a 5¼- or 3½-in. format.

Columbia University, Center for Computing Activities, 612 W. 115th St., New York, N.Y. 10025. 212-280-3703.

Information Presentation Technologies, Inc. has announced **Ushare for A/UX,** designed to run under Apple Computer, Inc.'s Macintosh II architecture. A/UX is the Apple implementation of the Unix operating system.

Ushare allows the Macintosh machine to function as a communication and file server for groups of Macintoshes and Microsoft Corp. MS-DOS-based microcomputer systems. All files appear as Macintosh files to the Macintosh operating system while appearing as Unix files to the A/UX Macintosh II. Ushare also supports transparent access to multiple A/UX servers.

The Ushare A/UX host software ranges from $395 to $2,995. Macintosh client software costs from $59.95 to $149.95.

Information Presentation Technologies, P.O. Box 8609, Calabasas, Calif. 91302. 818-347-7791.

A local-area network communication software package, **Cross/Point Version 5.0**, is now available from **Cross Information Co.**

New features reportedly include internetworking and encryption capabilities. The product also provides a new user interface that incorporates a simplified start-up screen, and additional facsimile and electronic mail are now available.

Cross/Point 5.0 costs $395.

Cross Information, Suite 311, 1881 Ninth St., Boulder, Colo. 80302. 303-444-7799.

Equinox Systems, Inc. has unveiled **Switchlan-8**, a zero-slot local-area network.

The product reportedly networks IBM Personal Computers and compatible systems using the PC's serial port and twisted-pair wiring. The LAN can connect up to 16 PCs, printers, modems and mainframe computer ports and provides hot-key file transfer, printer-sharing and terminal-emulation features, the vendor said.

The product is especially suited for small companies or departmental networking, Equinox claimed.

Switchlan-8 costs $995 and includes an eight-user software license and one network hub capable of connecting up to eight PCs.

Equinox, 14260 S.W. 119 Ave., Miami, Fla. 33186. 305-255-3500.

EXECUTIVE REPORT

MIS IN GOVERNMENT

State, local systems drafted for frontline public service

BY DAVID A. LUDLUM

Information systems are emerging from the back offices of state, county and municipal government agencies to play active and important roles in the delivery of critical public services.

Instead of simply crunching numbers for reports and performing other mechanical chores that keep the wheels of government turning smoothly, information technology is increasingly being used for tasks such as locating shelters for the homeless, improving the responsiveness of police and fire departments and issuing public safety advisories.

The Adult Services Division of the New York City Human Resources Administration, for example, uses an on-line database to monitor the status of about 9,000 beds for the homeless at more than 30 shelters citywide.

The system — running on Prime Computer, Inc.'s Primenet and Computer Techniques, Inc.'s Queo database — eliminates the division's former reliance on file cards and telephone calls.

With information on services and space available at shelters, Adult Services can more readily provide homeless people with the social services, medical attention and other care they require, according to Louis Mehl, director of its MIS bureau.

The system also lets officials call up files on individual cases and analyze demographics of the caseload, which helps them formulate policies, Mehl says.

The state of New York will soon institute a similar on-line system for the placement of juvenile offenders. The state's Division for Youth, a criminal justice agency, must choose appropriate custodial facilities for the adolescents that fall into its charge. The division deals with about 6,000 juveniles a year who have committed offenses ranging from school truancy to murder.

Within its 70 facilities, there is a wide divergence in levels of security and the educational, medical and counseling services offered. Furthermore, facilities provide each service to a limited number of people. Given the numbers and variations involved, it is easy to see how custodial placement could begin to feel like a battle against unfair odds.

To match placement possibilities and needs more accurately, the division upgraded a four million instruction per second (MIPS) Prime 9955 minicomputer to a 23.5-MIPS Prime 6550 in May. By next month, it is expected to finish loading files from a Henco Software, Inc. Info database to an Oracle Corp. relational database, according to Larry Vickers, the division's chief of data processing services.

That move will clear the way to install about 175 terminals at facilities across the state so the system can include detailed, real-time information on available beds.

With the upgrade, users should know whether each service is still available at a facility. Previously, they knew where beds were available and could check a book describing the services offered there, but they did not know whether the facility could handle additional cases for specific services.

Getting there faster

Providing better services can also mean improving response times. To that end, a growing number of state and local governments are deploying computer-aided dispatch systems.

When a dispatcher for the California state Department of Forestry punches in data on the location of a forest fire, a system running entirely on personal computer local-area networks generates information on the equipment needed, the nearest place it is available, roads and streets in the vicinity, navigational data for aircraft and area hazards.

The system runs 20 applications on 1,400 PCs tied into 70 stand-alone Novell, Inc. LANs. It maintains databases in 27 locations from which equipment and crews are dispatched. There are also PCs at 250 of the department's 500 fire stations.

The Forestry Department's data processing organization, consisting of 15 full-time staff members, developed the software using fourth-generation languages in Rbase from Microrim, Inc. and ODBS from O'Hanlan Data Base Systems in Ann Arbor, Mich.

The Phoenix Fire Department was a pioneer in computer-aided dispatching; its 6-year old system running on Digital Equipment Corp. PDP-11/44s, which are linked by radio to terminals in fire trucks, is still considered

MAX SEABAUGH

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Ludlum is a *Computerworld* senior writer.

Frontline

FROM PRECEDING PAGE

exemplary. In addition, the department uses mobile Apple Computer, Inc. Macintoshes that can access weather information and on-line databases on hazardous materials.

The dispatch system provides fire fighters with easy access to information on buildings and has let the fire department handle a rapidly growing volume of calls with a modest addition to its dispatching staff, says Gordon Routley, assistant to the fire chief. The department handles more than 300 calls a day and might manage more than 20 incidents at once during a storm.

"The computer doesn't lose fire trucks or forget who's going where," Routley says. "It's almost gotten beyond the ability of people to handle all that information."

By storing data on department activities, the dispatch system also supports decision making on matters such as training and location of new fire stations, says Paula McMann, a fire department administrative assistant who helped develop it as a programmer/analyst.

Creativity in application

States have maintained steady spending levels for information systems in recent years, consistently devoting an average of 1% of overall spending to the area, according to Carl Vorlander, executive director of the National Association for State Information Systems in Lexington, Ky.

Cities have boosted their spending from an average of 0.9% of total budgets in 1975 to 1.5% in 1985, the most recent year for which figures are available, according to the International City Management Association. Although that increase in commitment of funds puts the cities on a par with the federal government in terms of percentage allocation, both local and state governments are dealing with smaller amounts to apportion.

Generally speaking, that means there is little leeway for technological experimentation. For the most part, information systems managers at these levels must be content to adapt proven technologies in creative ways.

One notable exception to that rule is found in the relatively new field of geographic information systems (GIS), also known as geoprocessing systems. Many state and local governments are developing GISs, which are built around a database — in some cases on-line — that is a digitized map. From that database, the system can display or print maps with any combination of detail that a user species, such as roads, fire stations and water mains.

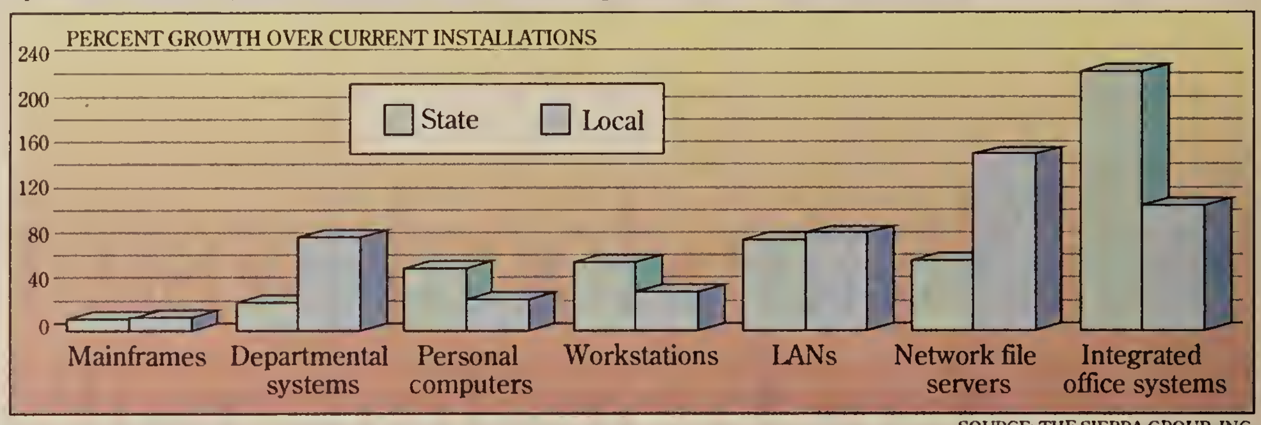
State and local government agencies are using the GISs to dispatch emergency services more quickly and with better information to control traffic congestion, to repair or expand infrastructures and to quickly call up information on a building or other location.

The origin of a GIS operated by the city of Los Angeles — the Automated Traffic Surveillance and Control (ATSAC) system — dates to federal funding of the Uniform Traffic Control System (UTCS) in 1975. The ATSAC went on-line as a demonstration of the UTCS covering the Los Angeles Coliseum area during the 1984 Olympics.

The city also has an on-line San Fernando Valley subsystem, and officials plan to start one up for the downtown area in three months, begin building two others next year and operate 35 covering the entire city by 1998.

Growth patterns

System installation plans for 1988 in state and local government show some significant priority differences



SOURCE: THE SIERRA GROUP, INC.
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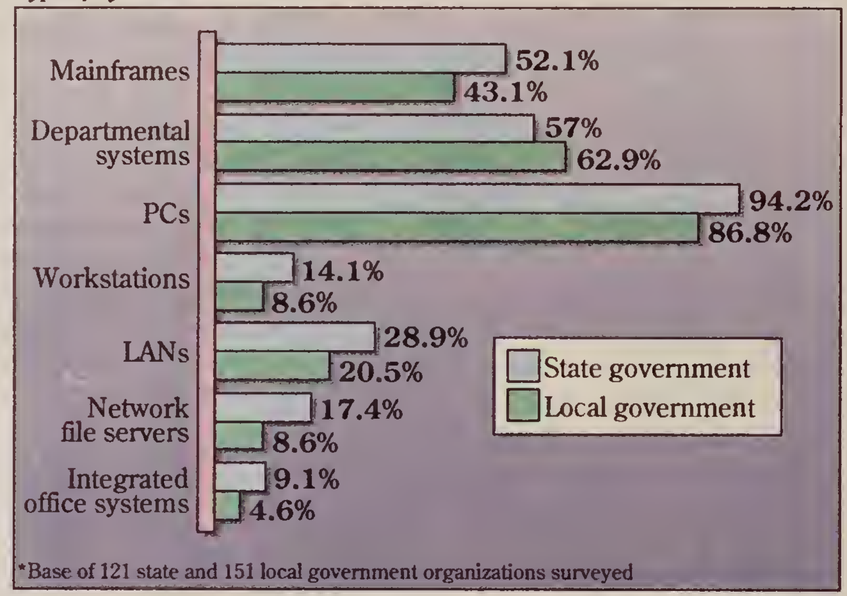
State and local technology adoption

*Percentages of organizations at both governmental levels with each type of system installed**



*Base of 121 state and 151 local government organizations surveyed

SOURCE: THE SIERRA GROUP, INC.
CW CHART

Los Angeles city workers use the ATSAC to display the status of traffic signals and the flow of vehicles. Operators can view traffic and signals in the entire city or zoom in on a single intersection. Within prescribed limits, the system automatically adjusts the cycles of traffic signals. With help from a network of video cameras, workers use the data to help the police and fire departments and issue advisories to the public.

A 1987 study of the system's Coliseum area loop, one of two already built, reported that the system cut travel time 13% and reduced the number of stops vehicles make by 35%, generating a value of $66,400 per intersection per year — a cost/benefit ratio of 9.8-to-1.

"It made us all happy to see the numbers," says Jack Massopust, a transportation engineer who helps design system operations.

CATS patrol traffic

The federal government provided money to implement the ATSAC's Coliseum loop for the 1984 Summer Olympics. Subsequently, the city of New York's Department of Transportation brought in the consulting firm that developed the ATSAC software, James H. Kell & Associates in Norcross, Ga., to develop its Computerized Area Tracking System (CATS), a traffic-monitoring system that will interface with an existing signal control network.

CATS will help officials steer congested traffic around obstacles such as accidents, construction work and festivals, says Raman K. Patel, the department's chief of engineering and communications. By storing data on traffic problems for two years, the system is also expected to help with planning, design and maintenance.

The benefits of computerizing traffic signals in the city include fuel-consumption savings estimated at $25,000 per intersection per year, reduced delays for drivers worth millions of dollars per year at the minimum wage and diminished air pollution, Patel says.

More typical of the adaptation of established technology to

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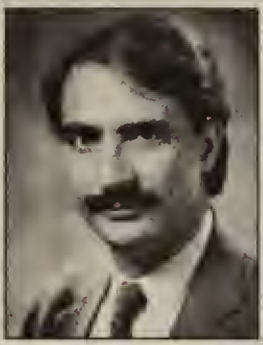
government service is the Pennsylvania Department of Welfare's use of on-line transaction processing for electronic benefits transfer (EBT) in a program that replaces food stamps with debit cards.

The program began in 1984 as a federal project to demonstrate EBT in the Reading, Pa., area with a point-of-sale debit card system.

"After two years, the users liked it so much they pressured the state into taking it over and turning it into a production system," says Curtis Pegg, director of the Department of Welfare's Division of Technical Services.



PTI's Toregas

The users are welfare recipients, food stores and banks that issue food stamps. The dial-up system serves 4,000 recipients and 160 locations. It runs on a Tandem Computers, Inc. TPX with 400 terminals and Mtech Action 2000 point-of-sale software. Results of the pilot project thus far are positive, according to participating merchants, who say the EBT system lowers costs from $18 to $13 per $1,000 of benefits redeemed.

The project also generates substantial savings of time and money for recipients, who no longer have to go to a bank every month to exchange forms for food stamps, as well as some savings for the banks, says John Kirlin, a senior analyst at Abt Associates, Inc., a Cambridge, Mass.-based consulting firm that evaluated the system.

"The overwhelming majority [of merchants] preferred the EBT system to coupons," Kirlin says.

State and local governments are also practicing creative adaptation on another level — adopting some of the innovative management practices associated with the strategic use of information systems in the private sector.

They are emphasizing training and are actively enlisting users in the development of applications. They are also forming steering committees to share technology and coordinate strategy within governments and among them.

Some governments are even mimicking an increasingly popular corporate information systems strategy — selling products that they have developed for internal use. The revenue they generate can help reduce taxes.

State and local governments lead federal agencies in their emphasis on training, according to Joseph Coates, president of J. F. Coates, Inc. in Washington, D.C., a consulting firm that has worked extensively with the federal government.

One effort in this area is the New York Technology Resources Group, which educates the city staff on computer and telecommunications technologies.

N.Y.C. Department of Transportation's Patel

Last year, the group brought the city a Technology Achievement award from Public Technology, Inc. (PTI), a nonprofit research group run by the National League of Cities and the International City Management Association.

Bus success

User involvement in applications development contributed to the success of the Washington, D.C., Metropolitan Area Transit Authority's fourth-generation bus maintenance program, the Bus Service Management System, according to J. Michael Murray, the authority's MIS director.

Murray credits a successful design — envisioned in large part by system users — for reducing the accident rate and helping extend the number of miles buses traveled between breakdowns from an average of 1,400 in 1983 to a 2,100 average last year.

"The key is to give the people who have to use the system a sense of ownership, that it's their system, not MIS' system," Murray says.

Governments traditionally share software and other technologies with their peers; with modification, shared systems often avoid the need for organizations to reinvent the wheel. Now, however, sharing is taking on new dimensions.

"Some of the states are beginning to establish forums for discussion that cut across many agencies," says Costis Toregas, president of PTI.

Last year, New York state launched its Forum for Information Resources Management, which promotes standards, training and research and recommends policies.

This year, Virginia officials formed a Council on Information Management, which will develop a four-year state plan for acquiring, managing and using information technology at state agencies and institutions.

Recently, governments, like many corporations, have moved to make money from their internally developed products. Hennepin County in Minnesota has licensed marketing rights for its GIS to a local company.

The county was giving the software to other governments but found it was spending too much money for training and support, says Richard Brubacher, a marketing consultant working with the county.

> "THE KEY is to give the people who have to use the system a sense of ownership, that it's their system, not MIS' system."
>
> J. MICHAEL MURRAY
> WASHINGTON, D.C., METROPOLITAN AREA
> TRANSIT AUTHORITY

Hennepin County's 15% royalty on sales has brought in $500,000 to reduce taxes and could be worth $1.75 million over four years based on projected sales, according to Brubacher.

In another tax stabilization drive, the Office of Computer Services and Information Systems in Metropolitan Dade County, Fla., has gone into business as a vendor of software and computer services. It offers other governments more than 30 applications.

The program, which is in a pilot phase scheduled to run through March 1989, is predicated on the notion of avoiding bad experiences with software that governments make available without charge, says Al Rutherford, marketing manager of the program.

For license fees ranging from $34,000 to $225,000, the office will assure buyers smooth operation of a system, Rutherford says.

Despite the strides governments are making, they still face numerous challenges. Many of them lie in the area of integration. For example, the next step for the California Department of Forestry is to integrate its PC LANs, tying headquarters to regional offices and local fire stations.

Doing so will mean dispatchers can send data to a fire station that is responding to an incident and officials can compile reports from the stations much more quickly.

Purse-string paralysis

Financial constraints cripple many efforts. Pennsylvania's Department of Welfare is seeking federal assistance to expand its widely acclaimed EBT system. Los Angeles, which also seeks federal funds, has a 10-year timetable for completing the ATSAC.

But many of the challenges lie in the realm of organizational coordination. For example, some computer-aided dispatch systems fail to quicken responses to emergencies because of a lack of coordination with telephone or radio systems that are run by separate organizations.

"Some of the issues have nothing to do with the technology being used," PTI's Toregas says. What is lacking is not equipment or software, he explains, but departmental agreements about who is responsible for what. •

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Keeping Big Brother out of government expert systems

BY MITCH BETTS

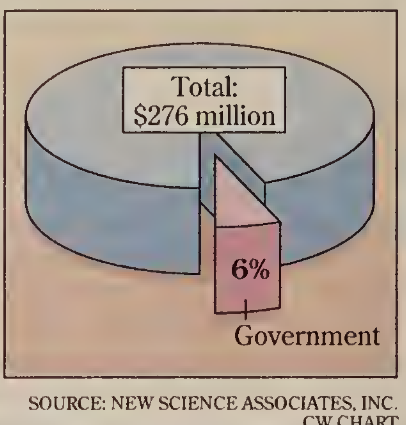
These days, it's hard to find a government agency that isn't at least dabbling in expert systems. The question is whether the developers or the public, in whose service this experimentation is being undertaken, are ready for the results that may ensue. Prototypes abound, with applications ranging from claims processing to crime fighting. A small sample includes the following:

- The National Ocean Service is developing a network of 110 expert systems to standardize the compilation of nautical charts.
- At the Federal Bureau of Investigation, the "Big Floyd" system — named after the FBI's top criminal investigator, Floyd Clark — is used to find relationships between thousands of suspects in labor racketeering cases and match the crimes to federal statutes.
- A sophisticated Artificial Intelligence Lab at the Internal Revenue Service is developing prototypes of 13 expert systems, including one to identify tax returns that are good targets for auditing.

Developers talk about benefits such as higher labor productivity and more objective and consistent decision making. But several observers point out that government managers have not yet addressed the thorny legal, security and ethical issues related to the government's use of expert systems.

AI procurement

Federal, state and local governments account for $17 million of the 1988 market for AI software and services



SOURCE: NEW SCIENCE ASSOCIATES, INC.
CW CHART

"Everyone rushes to embrace new technology . . . and gets excited about the perceived pluses, but they don't look at the dark side. It requires an awful lot of thinking and planning," says Susan H. Nycum, a partner and computer law expert at Baker & McKenzie, located in Palo Alto, Calif.

For one thing, the legality of using expert systems in government is not clear; the primary concern is how to handle the legal liability for any "bad" decisions or harm resulting from use of the system.

Judging from experience with medical expert systems, Nycum says, it is important to ensure that the expert rules are of tested quality and that the person who interprets the system's results is competent and accountable.

Furthermore, the knowledge base must be kept up to date, including changes in laws and regulations, or the expert system will produce wrong answers, notes John Hoskins, a senior analyst at New Science Associates, Inc., a research and consulting firm in South Norwalk, Conn.

Security is another issue that has not been addressed, although many expert systems are being developed for military and intelligence agencies, according to a 1987 paper by researchers Thomas Berson and Teresa Lunt.

The Big Floyd method

One agency that has tried to address the "dark side" of expert systems is the FBI. The bureau's Big Floyd system has stringent computer security and encrypted communications, and its decisions are reviewed by in-house lawyers, says William Bayse, head of the technical services division.

Bayse recommends that managers overlay their expert systems with security, privacy and data-integrity controls; make sure they are sensitive to civil rights; and provide audit trails and an explanation facility, so the whole chain of reasoning can be examined.

Still, a host of complex issues remains: When should the expert system's advice be followed and when should it be ignored? What happens when two expert systems come up with competing advice? Will politicians use expert systems as scapegoats for tough decisions, such as where to locate a hazardous waste dump? Should formal guidelines on the proper use of expert systems be developed? Will there be a public backlash against a perceived "government by computer"?

Conventional wisdom holds that the role of expert systems should be limited to advising human decision makers. There are others who say this approach may be too conservative. For example, Takashi Gomi, who has studied the government market as president of Applied AI Systems, Inc. in Ottawa, envisions a time when the general public will directly use intelligent systems to file claims or tax returns — just as people now use automated teller machines. ●

Betts is *Computerworld's* Washington, D.C., bureau chief.

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Clearing purchase hurdles

BY ESTHER SURDEN

Unlike their counterparts in industry, federal data processing managers are faced with legislated justification processes and procurement regulations that require them to take extreme care when approaching any acquisition. The entire procurement process, from project conception to contract award, bristles with procedures to check abuse.

The procurement rules are there for a good reason: to make sure there is healthy competition for government contracts. Still, the rules and procedures — especially those allowing lengthy protests by vendors who are not chosen for a contract — cause delays that can seem interminable to end users.

Delays are especially frustrating when procurements take several years in areas where technology is advancing rapidly, so that systems or methods are obsolete almost as soon as they are installed.

> ONE OBVIOUS way to deal with delays is to build more time into the anticipated schedule.

"One reason that delays are considered so painful is technology acceleration," says Eben Townes, a former contracting officer who is now director of International Data Corp.'s Procurement Information Management Service. "When product life is shorter than the procurement cycle, users don't get what they thought they were getting."

So how do managers cope? Townes says he believes one solution is better upfront planning to avoid protests that cause delays. "Everybody looks at protests as the major cause of delays. But protests are there for a reason," he says. "Quite possibly, the agency or department violated a regulation or statute. If government users took more time to anticipate problems and design better proposals and contracts, they could close off those vendor-caused delays down the line."

Technological obsolescence does not necessarily have to be the outcome of a lengthy procurement process, he adds. The U.S. Department of Defense, among others, has found ways to incorporate mechanisms in contracts that allow departments to obtain the latest technology as time goes on.

Lynn Furman also stresses the importance of careful planning in procurement. Furman spearheaded the successful acquisition of thousands of office systems for the Farmers Home Administration (FHA), an agency of the U.S. Department of Agriculture. The Farmers Home's computer acquisition is one of Washington's clear-cut success stories. Today, Furman is executive director of DP operations at the Office of Personnel Management, a government department that is always involved in numerous acquisitions.

"One of the key ways to avoid delay is to have a procurement strategy," Furman notes. "You have to develop contractual instruments that are flexible, have the potential for duration and allow you to incorporate options."

Managers supervising acquisitions often run into a catch-22 situation, in which the project has been budgeted for a particular fiscal year but that year is closing, Furman says. If the contract is not awarded, the managers lose the wherewithal to pay for the acquisition. The only real solution is legislated multiyear budgeting, which is now being considered, he adds. Until that happens, MIS managers can try to protect themselves in other ways.

One alternative is to make the terms of the contract variable, so that quantities can be ordered as funding permits, and a minimum purchase can hold a vendor to a contract until additional funding has been authorized. Although such arrangements create some problems for vendors, since they have difficulty determining quantity discounts under such an arrangement, they can have tremendous benefits for government agencies that are subject to the vagaries of legislative appropriations.

For example . . .

The Air Force Engineering and Services Center at Tyndall Air Force Base in Florida would have been a good candidate for such a contract. After spending four years on a procurement project for systems to automate service functions such as cafeterias and hotels as well as engineering functions such as facility operations, maintenance and military family housing, the center's budget was cut long before the acquisition was completed. The contract, which was awarded to Wang in January 1986, runs until 1991, but the officers in charge of the operation are afraid that the contract will run out before more funds are released.

One obvious way to deal with delays is to build more time into the anticipated schedule. If the manager knows it will take six months of planning, a year of procurement time and six months for protests, he can back up the cycle two years.

Furman says many managers are now doing this to some extent; in many cases, they are allowing at least an extra six

Continued on page 85

Surden is a free-lance writer based in North Caldwell, N.J.

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Relief for drought-plagued federal IS managers in sight

BY ARNOLD S. LEVINE

There may be some relief for information systems departments in federal agencies. For years, these departments have been fighting an uphill battle to attract skilled personnel because of the institutional rigidity of government hiring practices and pay structures. Those inequities persist, but there are some grounds for hope in that the Office of Personnel Management (OPM), which sets these rules and regulations, seems to be leaning toward substantive reform.

One indication of this is the recent release by the OPM of a report called "Civil Service 2000," which concludes that the median age of federal workers is rising, that agencies will have to work harder at buying or making the skills they need and that for many computer specialties, the government competes with the private sector on very unequal terms.

MONEY IS the main reason that the government competes on unequal terms with the private sector.

Another indication is a speech delivered by OPM Director Constance Horner at a recruitment conference in June. Horner described the current system as "slow, legally trammeled and intellectually confused and impossible to explain to potential candidates."

This description rings very true for many IS managers. Some say that the way things are now, they must either wait for a downturn in the economy to get qualified people to accept job offers or pay out of their own pockets to place ads in technical journals. Others report that their only option has been to scale down their projects.

General Services Administration official Jack Landers, who headed a task force to look at personnel policies, says that senior managers told him, "We wanted systems but couldn't attract the people who would make them succeed."

Money is the main reason that the government competes on unequal terms with the private sector. For example, before January's 4.1% raise, an entry-level computer scientist will start at $15,118, while someone with slightly more training or experience will begin at $18,726.

Compare this with the private sector. According to a survey by the College Placement Council of 187 placement offices at 154 colleges and universities, a computer science graduate with a bachelor's degree in science can start in the industry at $27,576.

Graduates in the 50th percentile, a rank based on their college grade point average (GPA), start at $27,744, and those in the 90th percentile begin at $31,200.

Figures for electrical engineers with telecommunications experience show the same disparities. The governmentwide and Justice Department starting salaries are the same as those in the computer scientist series. By comparison, the private-sector salaries for average offers, 50th percentiles and 90th percentiles are $29,688, $30,000 and $32,300, respectively.

The OPM is doing what it can to make the system more flexible — granting more direct-hire authority, waiving some requirements for entry-level positions and proposing to allow agencies to use fee-paid professional recruiters to find the people they need in selected instances.

Because of the extension of direct-hiring authority, agencies can now hire applicants in certain categories such as electrical engineering without a lengthy preliminary screening by the OPM.

Experience starts to pay

Agencies are now also able to negotiate starting salaries with qualified candidates at the highly experienced GS-11 level and above. In some cases, they can offer as much as 20% above the candidate's present pay, based on his superior qualifications or the agency's special needs.

Many agencies, such as the U.S. Air Force's Wright Aeronautical Laboratories, also use cooperative programs — an approach that enables an agency to hire students from local universities and even high schools for one or two semesters in the hope that some will eventually be hired full-time.

Even more radical innovations may be in the offing. The OPM's Horner has proposed that agencies be given the authority for direct hiring and recruiting on the basis of an employee's college GPA.

Horner's proposal would do two things. First, candidates would be eligible for consideration if they have a minimum GPA, somewhere between 3.0 and 3.25. Second, candidates who failed to make the cut would be eligible if they passed occupationally based exams designed by the

---

Levine is a free-lance writer based in Gaithersburg, Md., and a frequent contributor to *Federal Computer Week*.

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OPM. But until Horner's proposal becomes procedure, depending on who heads up the next administration and the OPM itself, agency managers will have to continue to use other tactics in competing with the private sector for computer professionals.

Some of the more successful strategies include the following:

- Stressing the challenges and opportunities that can be found in working on government systems projects.
- Pointing out that perseverance is rewarded. For example, while salaries for entry-level government computer specialists are lower than in the private sector, they tend to catch up within three to five years.
- Using training as both an entry incentive and an inducement to stay.

Renato di Pentima, deputy associate commissioner of systems integration at the Social Security Administration (SSA), says his agency uses separate approaches for entry-level and senior employees. For new hires, his office assigns mentors who are themselves senior managers, to work with the employee. At the same time, the SSA provides extensive training, including tuition-paid university courses, and a series of career advancements.

For senior employees, SSA provides further training and exposure to the most advanced technology the agency buys.

> RETAINING senior people is likely to become a greater priority in the next few years.

Retaining senior people is likely to become a greater priority in the next few years. Numerous studies show that the government work force in the year 2000 will consist largely of technology-intensive jobs that demand constant retraining.

Several government units, such as the National Institute of Standards and Technology, formerly known as the National Bureau of Standards, and U.S. Navy laboratories in San Diego and China Lake, Calif., are taking advantage of congressional legislation that authorizes experiments in personnel simplification to build better reward systems and enrich the work experience.

The main features of these programs include the substitution of a few broad pay "bands" for the 15 standard government pay ranges, the pegging of pay raises to performance and the assignment of responsibility for drafting job descriptions and recruiting to line managers.

In the end, if these demonstration projects succeed, they may become the government norm, whether by due course of law or the quiet adoption of key features by other agencies. •

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Purchase

CONTINUED FROM PAGE 83

months for acquisitions to cover contract protests.

Among the most pernicious effects of lengthy procurement cycles are the ill-advised end-run measures that agencies sometimes take to attempt to get around delays.

An example of this might be to use multiple micros when a minicomputer is desired. The micros might not be the optimum equipment, but they can be put online faster. Micros can often be acquired under General Services Administration schedules, a streamlined acquisition process that can be completed in weeks.

Furman suggests that flexible contracts offer a better alternative for managers with pressing deadlines. "If you've already structured one of those flexible contracts, you can buy some more on it or buy a technological upgrade on an existing contract," he notes, cautioning that this is far from the best solution because the systems purchased will probably not be the perfect fit for the job.

The FHA never planned a fallback strategy when it automated its 1,950 county offices, 275 district offices and 46 state centers. There were just too many locations to consider proceeding in any other manner than what the agency envisioned, says Robert E. Sherman, acting deputy director for management at the FHA.

Luckily, the agency never faced any funding cuts or challenges to its contract, which went to Electronic Data Systems as primary contractor with AT&T providing the office systems, according to Sherman.

Good planning and a multivendor approach may have helped ward off the complication of contract protests. While AT&T provided most of the computers, the plain-vanilla computer systems included several non-AT&T options. AT&T provided multivendor systems integration, which was a departure for that vendor.

The procurement was completed in about two years. Sherman attributes at least part of this feat to a simple but seldom-used technique of consensus management. If all parties interested in an acquisition — program planners, administrators, contracting officers and information resource management officials overseeing computers, telecommunications and records management — can become involved in each step concurrently, there is a better chance of minimizing delays. •

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IN DEPTH

The ins and outs of software testing

An eight-point reality checklist can lead MIS to more efficient techniques

BY BOB STAHL

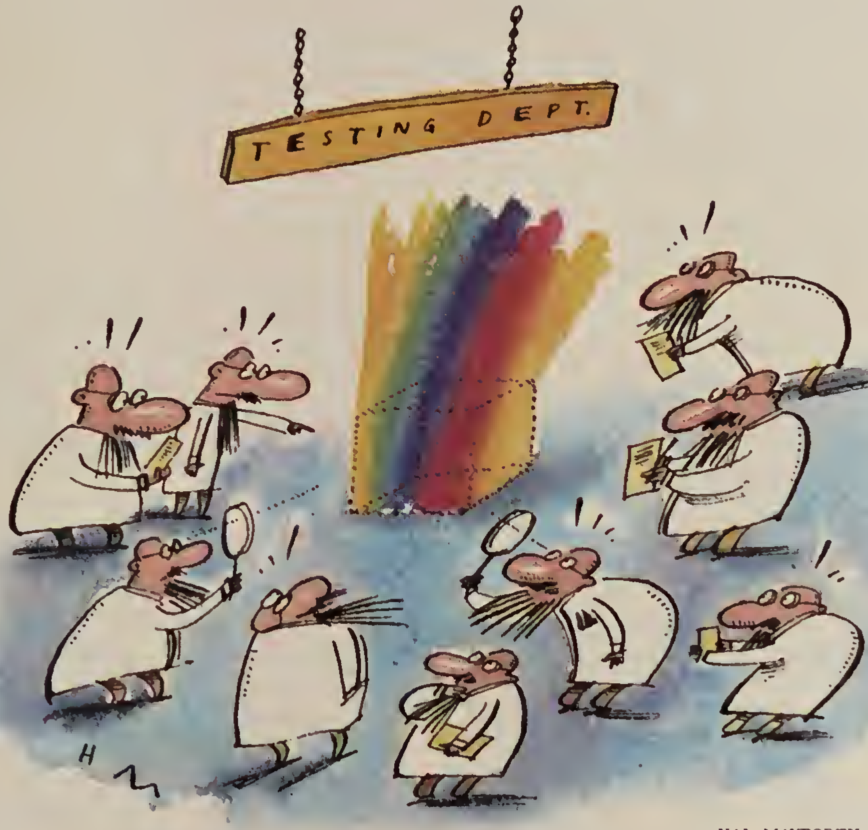
Wealthy people in ancient China used chopsticks made of either silver or ivory for a very practical reason. They believed that if the food contained poison, silver chopsticks would tarnish and ivory ones would shatter.

Several thousand years later, MIS may be trying to test computer software with methods that are not much more practical.

As the cost of defective software has risen to unacceptable levels, many MIS organizations have decided to get serious about software quality. But too often, what happens then is that a magic wand is waved over some programmers or end users and — poof! — they are now Software Testers.

Testing software is very different from writing software or using software. It is unrealistic to expect someone to test software well simply by guessing what to do based on experience as a programmer or end user.

Software's dismal reputation is largely the result of inadequate testing. Fortunately, however, testing is not a black art. Testing has several of its own realities — eight of which follow — that, when understood, can lead to an effective approach.



HAL MAYFORTH

• **Reality No. 1: You can't test for everything.** In a program with 75 branches, there are more possible test cases than there are teaspoons of water in the Pacific Ocean.

There are two ways to understand why this is true. If you look inside a program at the code, the Glass Box approach, you will see that each branch statement can change the way the program executes — for example, in two ways for a two-way branch. Thus, in a program with "N" branches, there are 2^n power different possible paths through the program, and 2^n power gets big very quickly.

Since a branch may be an If statement or a loop control — an implied If — it's clear that anything other than a toy system has many more possibilities than this.

Another way to see the large number of test cases is to calculate the number of possible combinations of input data — the Black Box approach. This gives the same astronomically large number, since different data values are what cause a program to take different paths when it executes.

The unmanageably large number of possible test cases is the crux of the matter in software testing.

It explains why systems that have been intensively tested still have serious bugs when placed in production.

It also clarifies the central problem of testing, which is that testers must prepare a relatively small number of sets of input values — test cases — then examine the system's output — test results — for these cases. From this information, they must generalize to predict how the system will behave for *all* possible sets of input.

This is a large challenge, but it is an unavoidable consequence of the impossibility of testing for everything. The strategy for selecting test cases is, therefore, a crucial component to effective testing.

• **Reality No. 2: Testing should be driven by risk.** Since we cannot test for all possibilities, it makes sense to concentrate on the areas that present the greatest risk.

Denis Meredith, an independent testing consultant in Torrance, Calif., suggests a particularly elegant way to evaluate risk. He considers two risk factors: impact and likelihood.

For a given module or piece of the system, impact is the negative consequences that may result if that piece operates incorrectly. Likelihood is the probability that the piece will fail. Risk is the combination of impact and likelihood.

If the different pieces of a system are evaluated and their impact and likelihood are plotted on X-Y axes, those modules that have the highest risk will fall in the upper right quadrant. These modules need to receive the bulk of the testing effort because they have both high impact and high likelihood.

Impact will depend on what the system does. The highest impact corresponds to bugs that have real-world consequences. If a certain part of the system operated incorrectly, what might happen? Could airplanes crash together? Could paychecks be issued with extra zeros in the amount field? Could hackers gain

……

- **Focus on high-yield test cases**
- **All bugs are not created equal**
- **Welcome to the Dependency Islands**

Stahl is president of The Interface Design Group, a software-testing, training and consulting firm located in Oakland, Calif.

unauthorized access? Could management discount a report because unaligned columns made it look sloppy?

Another level of impact would be internal problems — the system locks up, a database is corrupted, users lose work time and so on. The system might perform correctly, but it would be difficult to use [CW, Dec. 7, 1987].

Likelihood is an estimate of the probability that the module will fail.

SUPPOSE acceptable input for a data field is a number between 1 and 100. It is a waste of effort to test 47, 58, 3 and 21.

Some factors that contribute to likelihood are the complexity of the logic of a module, how many other modules it interacts with, the module's size, whether the technology itself is new or just new to the organization, the experience level of the programmers and so on.

A meeting of system builders — including users, designers and programmers — should be able to assign relative impact and likelihood ratings if they use Meredith's three rules:

1. Rating questions should be easy to answer.
2. Each question should be obviously relevant.
3. Each question should differentiate between modules in the system. A factor is not useful if most modules receive a rating of 5 on a scale of 1 to 10. Ratings such as size should be relative to other modules in the system.

When the modules have been ordered by relative risk, levels of testing effort can be allocated. This should also influence the order in which the modules are produced: The critical modules should be created first.

If the high-risk modules are delivered late in the schedule, they stand little chance of receiving the testing time they require.

• Reality No. 3: There is a big difference between running 500 tests and running one test 500 times. If input values are selected randomly, many tests will exercise the same path through the system. This does not yield any new information.

To maximize testing effectiveness, try the powerful concept of Equivalence Classes. Two input values are in the same Equivalence Class if they are handled by the program in the same way. In Glass Box terms, they cause the same code to be executed. For example, suppose acceptable input for a data field is a number between 1 and 100. It is a waste of effort to test 47, 58, 3 and 21, because these numbers all reside in the same Equivalence Class. If 47 works, there is a high probability that 58 and the others will work. It is a better idea to test just one number between 1 and 100, then move to other Equivalance Classes such as 0, a negative number or a number greater than 100.

There are two types of Equivalence Classes, valid and invalid. In the example above, the numbers 1 to 100 constitute a valid Equivalence Class. Negative numbers are examples of invalid Equivalence Classes, as are nonnumeric characters. The distinction is important because the testing procedure is different for the two types.

For instance, you have to test invalid Equivalence Classes one at a time. This is because when you make a test run, there will usually be several input fields. You can test different valid

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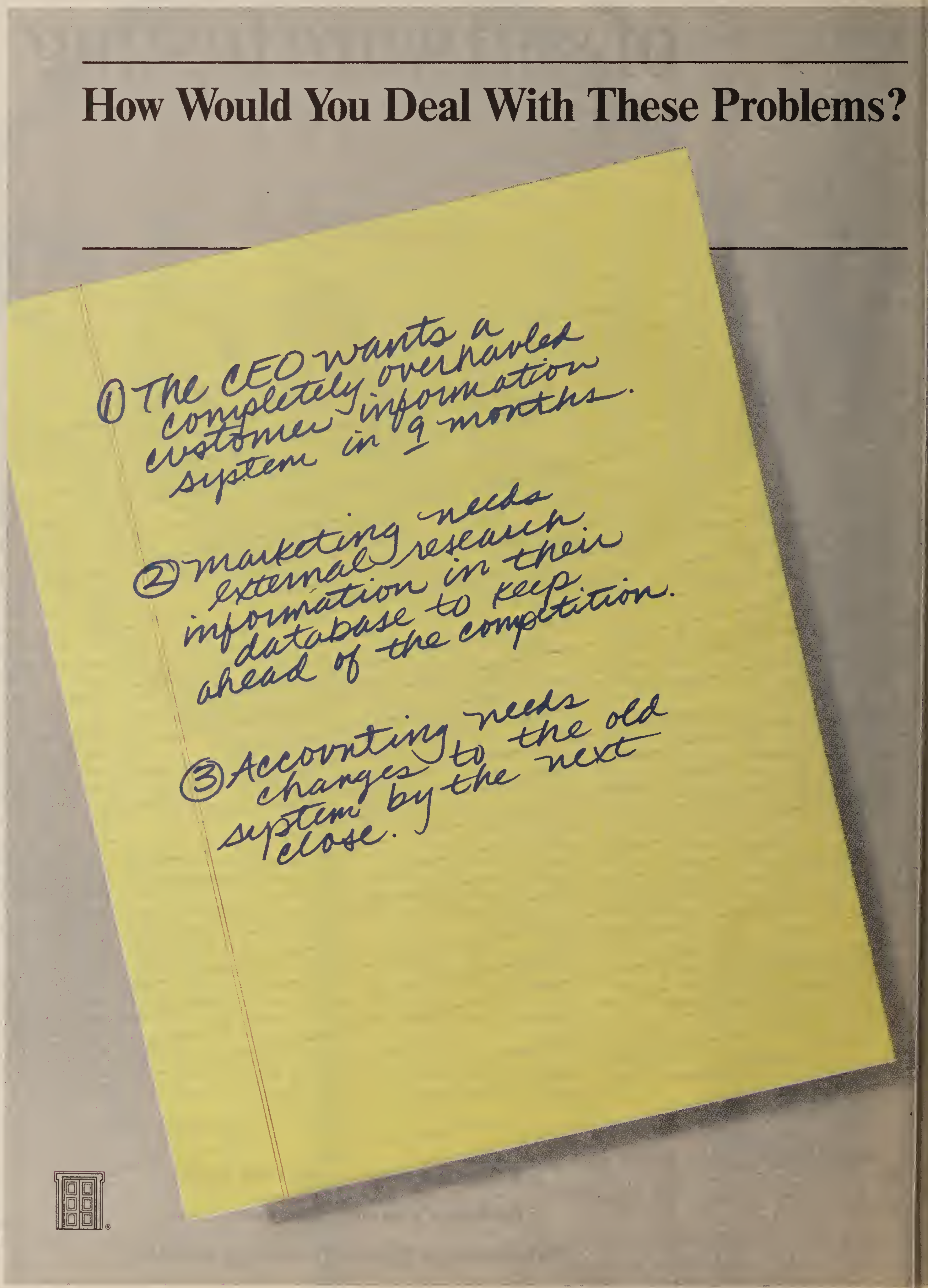
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Equivalence Classes for each field on the same test run, but you have to make a separate run for each invalid class, because you can expect invalid input values to generate an error condition. When multiple input fields contain invalid values, the first one picked up will usually mask the effect of the other invalid values.

Equivalence Classes are a key tool in constructing meaningful test cases. While they constitute only educated guesses about a program's behavior, they are remarkably effective in practice.

- **Reality No. 4: You can often guess where trouble is lurking.** Since we cannot test for everything, it makes sense to focus on high-yield test cases. The process of spotting these test cases is called Error Guessing. One place where things go wrong is at the boundaries of ranges of values. If, as above, a number is supposed to be between 1 and 100, the cases of 1 and 100 are more likely to cause problems than are the values in the middle.

For instance, it is very common not to have a loop counter not be specific about the endpoints in the specification. These cases of Error Guessing are called Boundary Value Analysis.

Another example of a high-yield case is the value zero. Any numeric field should be tested for zero since it frequently causes problems, especially for division by zero.

Using exception processing is another good way to go about finding errors. For example, if a system makes reservations, try canceling a reservation, canceling a nonexistent reservation, making the same reservation twice and so on. Often these cases have not received the same attention that the normal case has, and you'll find a problem.

Finally, be aware that errors do not occur randomly: They cluster. If you've found a number of bugs in one part of the system, you can bet there are more. In general, the probability of finding a bug in a part of the system is proportional to the number already found in that part. Resist the temptation to move on; continue testing that area until things get very clean.

> IT IS surprising how often a mundane test case will not work. There is little point in devising elaborate testing strategies until the part you are testing is fine-tuned enough that at least one case works.

- **Reality No. 5: Know your inputs and outputs.** When you test a system or a piece of a system, the first goal should be to make one test case work. It is surprising how often a mundane test case — using middle-of-the-road, valid values — will not work.

There is little point in devising elaborate testing strategies until the part you are testing is fine-tuned enough that at least one case works.

When one case works, the crucial point in testing occurs. What next? The number of possible sets of input values you could try are nearly infinite.

There's Error Guessing, of course, and that will find some additional problems. But what do you do after that? Even using Equivalence Classes to reduce the number of possible test cases, the number is still far too large to deal with.

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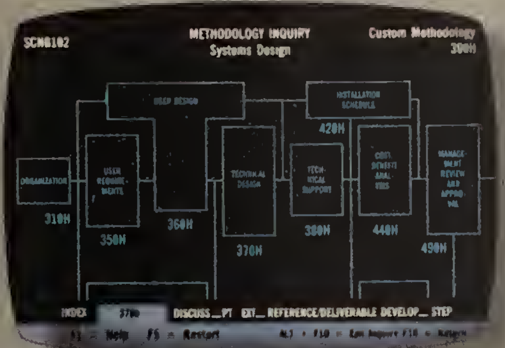

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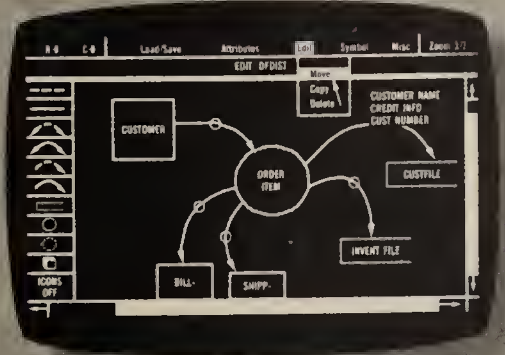

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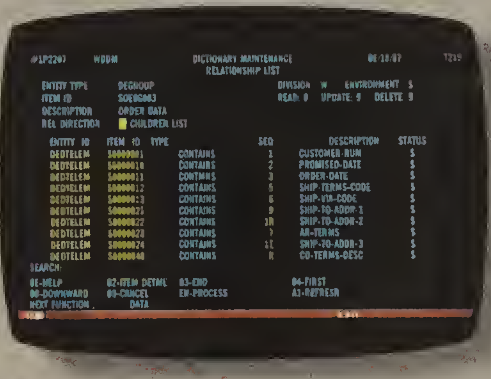

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called Dependency Islands that makes this problem tractable. Here's how it works.

Suppose you are testing a piece of the system that has six input fields — call them F1 through F6. When it runs, this piece of the system produces three outputs — Output 1, Output 2 and Output 3. These outputs are the test results for the test-case inputs F1, F2, F3, F4, F5 and F6.

If all the outputs depend on all the inputs, there are too many combinations of input to deal with, even using Equivalence Classes.

Assume that each of the six inputs has five valid Equivalence Classes. The number of possible test cases is then 5^6, or 15,625.

> USING Dependency Islands will usually greatly reduce the number of test runs. In one example, the 15,625 possible test runs were reduced to 155.

Usually, however, each output depends on only some of the inputs. In this case, a vast simplification of testing is possible.

Assume, then, that Output 1 depends only on the inputs F1, F2 and F3; Output 2 depends only on the inputs F4 and F5; and Output 3 depends only on F6.

Now you can test each output independently. Since Output 1 depends only on F1, F2 and F3, you can step those input fields through just 5^3, or 125, equivalence class combinations. You can leave the values of F4, F5 and F6 at whatever value they were set when you made the first test case work.

Similarly, since Output 2 depends only on F4 and F5, you can test Output 2 independently with 5^2, or 25, tests. Output 3, which depends only on the input F6, can be tested by itself with only five tests.

Furthermore, since the outputs are independent, they may be tested one at a time — to keep things simple — or in parallel — to produce the absolute minimum number of test runs.

The technique was designed to gauge the dependencies of the outputs on the inputs. In general, devices such as tables do not work, since the ordering of the table columns determines whether a grouping pattern is evident. The way around this difficulty is what gives the Dependency Islands technique its name.

To make Dependency Islands, simply write each input anywhere on a sheet of paper (see diagram). Now draw each output as an island that encloses the inputs on which it depends. The grouping is then obvious. A little experimentation will show that it does not matter how the inputs are placed on the page; the islands can always be drawn.

Using Dependency Islands will usually greatly reduce the number of test runs. In the example above, the 15,625 possible test runs were reduced to 155 (if we test the islands sequentially) or even to 125 if we test them in parallel.

In addition, a number of refinements to the technique are possible, such as exercising just the Equivalence Classes within an island rather than trying all combinations of classes. This would reduce the number of test runs still further but at the cost, perhaps, of missing a key, error-producing combination.

Dependency Islands show many other things as well. For example, an input that is merely captured and not used to produce output for a particular function will not fall within any island. That input needs to be tested only once to show that it has been captured.

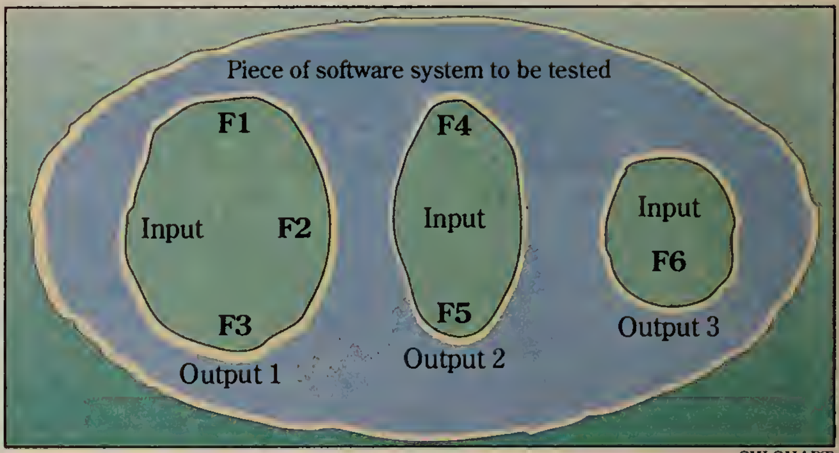
What does it mean if the islands intersect or if one is contained within another? This merely indicates that an even further reduction in the number of test runs is possible. However, in practice, too much condensation can lead to confusion. It is usually best to ignore overlap of islands and proceed as though they were completely separate.

A more important question is how to determine the dependencies of the outputs on the inputs. One way not to do this is to attempt to follow the program logic and see how things depend on one another in the code. This approach is called Cause and Effect Graphing, and it rapidly produces overwhelming complexity.

The key is to focus on *which* inputs each output depends on, not *how* it depends on them. Return to the specifications and to the users. Users familiar with the application can tell you what depends on what. Dependency information should be gathered during the analysis phase of

An example of a dependency island diagram for a set of inputs

Output 1 depends on inputs F1, F2 and F3; output 2 depends on inputs F4 and F5; and output 3 depends only on input F6. When testing a piece of software, the input islands may be tested independently, either sequentially or in parallel.



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system development and stored in the data dictionary. Then you can automate the drawing of Dependency Islands and the construction of test cases.

This view of the Dependency Islands approach assumes an input/processing/output structure. Examples include processing an insurance application and issuing paychecks. There is another type of test situation, however, in which the function to be tested is action driven — the "do-it-to-it" structure.

In this format, actions are performed on objects — for example, "DELETE FILE APS 2081" or "SEND msg TO user id."

There is an alternative way to use islands that considers such actions and classes of objects. A similar payoff in reduction of the number of tests occurs.

An additional benefit of the Dependency Islands approach is that software testers always know exactly why a test run is being performed and what has been tested by that run. Management can then have a definite confidence level about the status of testing.

- **Reality No. 6: Many software problems lie in the specifications or their interpretation.** A number of studies by IBM, Chemical Bank and other organizations have shown that two-thirds of the errors discovered in a system are ultimately traced back to the specification or design rather than the coding.

These results have enormous implications for testing. The key to preventing errors from being propagated forward into the code is to hold regular walk-throughs of the requirements, the design and the specifications.

An added benefit of discovering errors in a walk-through is that they are nailed at the source. This prevents the time-consuming process of discovering an error by the symptoms it manifests during a test, then laboriously tracing it back to the cause.

The earlier you find it, the cheaper it is to fix.

- **Reality No. 7: Measure how you're doing.** A tough question in testing is, "When am I done?" The historical answer, of course, is that you're finished when the time or money runs out. This unfortunate trend has caused the term "completely debugged" to evolve in meaning to "the users will find the rest of them." The obvious problems with this approach have led to the current ground swell of interest in better methods of testing.

A TOUGH question in testing is, "When am I done?" The historical answer is that you're finished when the time or money runs out.

Therefore, every test plan should contain a section called Completion Criteria. One such criterion occurs when a carefully selected set of test cases — constructed by using Equivalence Classes, Dependency Islands and Error Guessing — has been executed.

If there are too many possible test cases to complete them all even using these techniques, then a substantial drop in both the number and the severity of bugs being found may indicate that you're getting to the point of diminishing returns.

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the number of bugs found must be plotted against a constant level of testing effort, not merely against time.

If, for example, one of two testers goes on vacation, the number of reported bugs will naturally drop.

By using risk to drive the testing effort and prioritize the test cases, you greatly increase the probability that if testing has to stop, you have found most of the serious bugs.

• **Reality No. 8: Anticipate the politics of testing.** With the stakes so high, it is inevitable that politics will eventually find a way to intrude on the testing process.

The most common political problem is that testing gets viewed as a destructive activity. Since everyone has made commitments about getting the new system released, there is a strong tendency to think of the testing process as a rubber stamp. It becomes a mere validation of the system and ends up being used simply to clean up any little oversights that may be present.

If serious problems are uncovered, however, a number of people will feel threatened by the testing procedure. Programmers and designers will feel that their sterling efforts are being unjustly nitpicked. Managers will see schedules slipping — a bad thing. Each new bug will be greeted with, "OK, go ahead and document it. We'll fix it in the next release."

The end result will be the release of a shaky system, after which there will be plenty of time for finger-pointing.

How can you avoid such disasters? Have a sound test plan in place, and get sufficient executive backing for it before testing starts.

In some organizations, test managers have the authority to cancel the release of a system that they don't believe is ready. Make sure that any test plan you accept schedules time to *fix* bugs that are found — not merely document them.

A second political problem is the definition of a bug. Keeping score is essential for determining when to stop, but it can also be used to measure the effectiveness of the developers and the testers, an obviously touchy area.

What is a "bug"? Is it a symptom, as discovered by the testers — that is, a Trouble Report? Or is it a defect in one line of code? Since one error in the code can trigger 200 Trouble Reports, there is room for problems in these definitions.

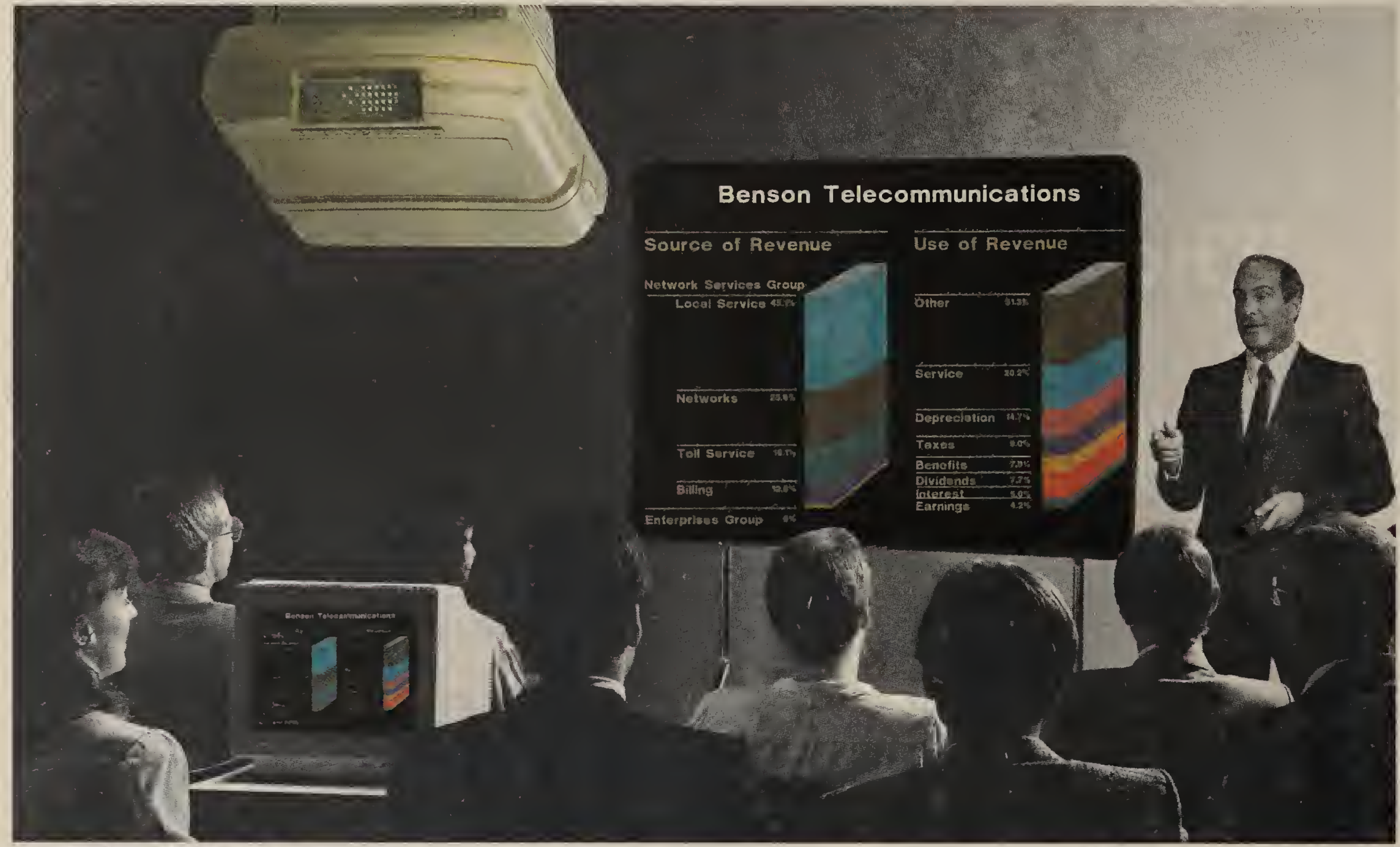
Developers naturally want to count defects, while testers want to count the number of Trouble Reports they have generated.

Furthermore, is it meaningful to count all bugs as though they are equally important? Shouldn't a severe bug that destroys a large customer database be somehow worse than one that only mislabels the pages of a report?

Suppose you were to weight each bug by time — or cost — and impact to fix. Wouldn't that reward the developers and testers and encourage them to pay more attention to what is really important?

There aren't any universally applicable answers to these software testing questions, because a solution in the real world will depend on what types of systems are being developed, what the organization's priorities are and what is realistically possible politically. All sorts of metrics have been used successfully.

The only true criteria for success are a real understanding of the core issues of testing and a commitment to producing quality software. •



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TAKING CHARGE

James Connolly

Walk on the cautious side

It may seem like there's been no limit to the use of the phrase "strategic use of information systems" lately. It certainly has appeared frequently on these pages in connection with comments about what people in MIS are doing well.

Phrases such as that — "Information Age" is another — remind us of the good that computers can do. They can save lives by supporting medical research, make life more comfortable and help businesses and individuals prosper. But occasionally, people committed to a better world through information can stop to think about the dark side of computers.

Such a sanity check came last week during a routine scan of the morning mail and a quick look at literature sent out by the organizers of the Tri-Ada '88 conference scheduled for this week in Charleston, W. Va. The literature promoted a speaker ready to discuss the need for certification standards for programmers. While such a theme may be common, the literature highlighted the following examples of havoc a software bug can wreak:

- A cancer patient dies from an overdose of radiation.
- A military jet crashes.
- Robotic arms kill a factory worker.
- A woman kills her daughter

Continued on page 95

Rooney turns DP at baseball hall of fame

BY CLINTON WILDER
CW STAFF

Among the hundreds of exhibits in The National Baseball Hall of Fame and Museum, Manager of Information Systems Patrick Rooney is particularly proud of two.

One is a large aerial photograph of The Bronx, Yankee Stadium and the old Polo Grounds, in which Rooney can point out the apartment building he lived in as a boy. He sold peanuts at both those historic ballparks in the summers.

The other special exhibit in the Cooperstown, N.Y., baseball shrine is a user-interactive CRT screen with which hall of fame visitors can spend hours comparing baseball statistics or watching videos of their diamond heroes, courtesy of compact-disk storage and an IBM Personal Computer AT.

The marriage of computer technology and baseball is a happy one for Rooney, who brings 27 years of data processing experience to the mecca of the national pastime.

"The nice thing about working here is that the medium that we work with — baseball, its history and everything associated with it — is always changing," Rooney says. "It's dynamic, not static. That makes my end more exciting because there are always new and different things to do."

Origins

Rooney cut his DP teeth on the IBM 1400 mainframe series at General Motors Corp.'s Tarrytown, N.Y-based assembly plant in the early 1960s, then joined the DP operation of Central Hudson Gas & Electric in Poughkeepsie, N.Y.

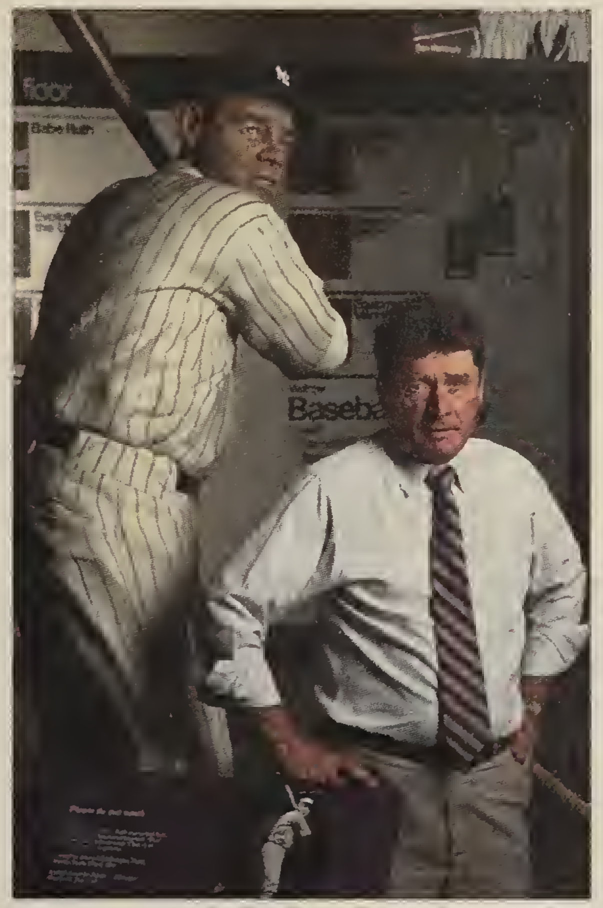
That company's largest customer is IBM. Rooney rose to the top of the utility's DP operation during a 17-year stay but moved farther upstate several years ago in search of a new career. "The stress was getting to me," he says.

He created and taught the DP curriculum at a Cortland, N.Y.,

Continued on page 99

PROFILE

Patrick Rooney



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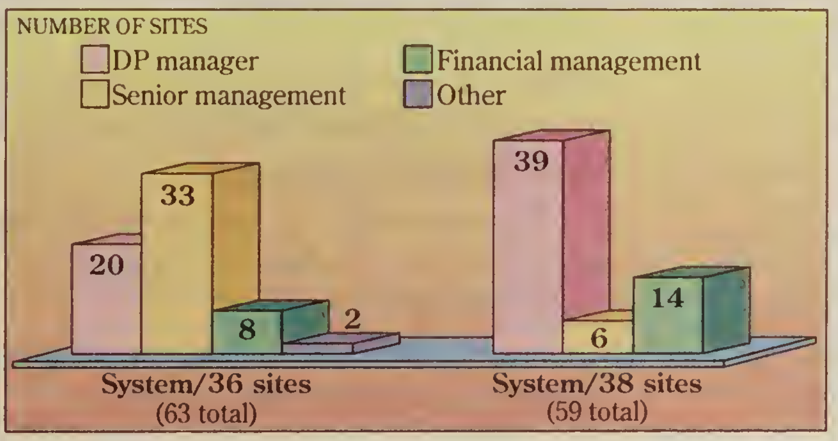
Data View

Who OKs an AS/400?

DP managers and senior execs possess varying degrees of buying power, according to a survey of 95 IBM System/36 and 38 sites planning to acquire an IBM Application System/400



SOURCE: FOCUS RESEARCH SYSTEMS, INC.
CW CHART

Share chief steps in, reorganizes

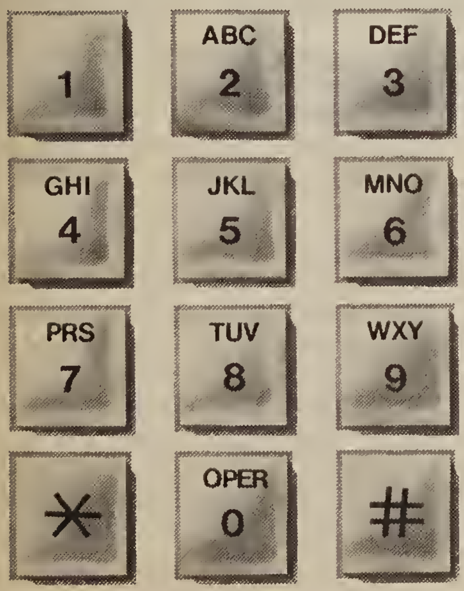
BY JAMES CONNOLLY
CW STAFF

ITHACA, N.Y. — With an eye on changing times and issues, the new president of the IBM users group Share, Inc. recently launched a reorganization simultaneously with taking office.

The goal of the reorganization, according to Share President Cecilia Cowles, is to maintain the quality of the group's technical program while making Share more responsive to the changing needs of members. The moves involved distributing planning and logistical responsibilities — previously loaded on one director — among several directors.

"The issues for Share are changing as the issues in information processing change. Share has a reputation for being really good at mainframe operating systems, and that is something we want to continue to do and always do. But we are finding that there is more focus on networks and the mid-range, and we have to address those," said

Continued on page 98



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CASE tops agenda at DAMA talk

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Data administrators must learn to use computer-aided software engineering (CASE) tools to better serve their fast-changing businesses, said speakers at a recent Data Administration Management Association (DAMA) conference.

Just as factory automation led to the development of just-in-time procedures, the process of restructuring databases should lend itself to reusable data and tools to efficiently reorganize that data.

"Data relationships can be changed by product changes," said Gary Salton, first vice-president of planning and control at Homart Development Co. "A firm's competitive strategy signals where the greatest returns are to be had, and a data administrator's strategy should be in step with that."

As examples, Salton cited databases Homart created to spot real estate for shopping malls and to provide data for financial analysis. The business of "building shopping centers is a mature industry," Salton said. "We are engaged in a long-term battle for market share. By using systems to identify new opportunities, we are putting more horsepower into our market research group."

The technique Homart uses can be applied to other businesses, DAMA speakers said. "Data administration is going through the same kind of transition any manufacturing business goes through," explained John Zachman, a consultant at IBM's Western region in Los Angeles. "We should have off-the-shelf data instead of off-the-shelf systems," Zachman said. "We must design reusability of data into the overall system."

Flexible database structures will allow users to gain new insights, even if the same data is used again and again, Zachman said. "You need to have a dynamic infrastructure [for data] if management doesn't want to define what the company's product will look like until the customer walks in the door," Zachman said.

One way to quickly create and recreate data structures involves the use of CASE tools. Ian Palmer, president of James Martin Associates, Inc., told the 150 DAMA attendees that CASE could dramatically ease the revamping of a corporation's underlying data structures.

"The only reason to have an information architecture is to impact systems that will be up and running in a short period of time," Palmer said. "People should be aiming at a 12-month time frame at the most."

Without an automated approach, he said, development of databases often drags on for years. "You'll often find that you have duplication of data in many places," Palmer said. Now, CASE tools are available to make sharp cuts in development time. But, Palmer conceded, it is difficult to measure the impact of CASE tools on shortening the design cycle, which consists of 60% to 70% of development time.

Connolly

CONTINUED FROM PAGE 93

and tries to kill herself and her son after a computer error led to a false report of their having an incurable disease.

It may be that not all of the blame in those cases should fall on the computer or the programmer. This is not the space to debate the individual cases. Rather, they should be mentioned as examples of what everyone in the computer industry and on the user side of computers should keep in mind. Computers and overreliance on the data in computers can have pitfalls, and everyone from the data entry clerk to the chief information officer should keep in mind what the wrong data or a bad instruction can mean.

Consider the cost

True, IBM mainframes aren't likely to crush the operations manager. However, systems planners who want to automate a process must consider the cost in human suffering that displacing workers can have. Even if the cost does not warrant scrapping a system, it is a cost, just like the cost of hardware and development, that must be balanced with the system's benefits.

Those who manage systems and those users and processes that rely on systems also must remember that data might be a corporation's crown jewels but that it isn't sacred. Consider the mess that even one data error can create.

Most people have read about computers being blamed for an innocent person being jailed, and most people have had a personal experience with a bureaucrat in a customer service office or a credit office who insists that the washing machine was delivered or that the bill was never paid. Why does he insist? Because "the computer says so."

All of these incidents do not mean computers are evil. If that was the bottom line, this newspaper would have to change its name. Rather, they are listed here to serve as a reminder that now and then it's worth everyone stepping back just a bit to assure themselves that they are conscientious and careful in how they use the magic of computers.

Connolly is *Computerworld*'s senior editor, management.

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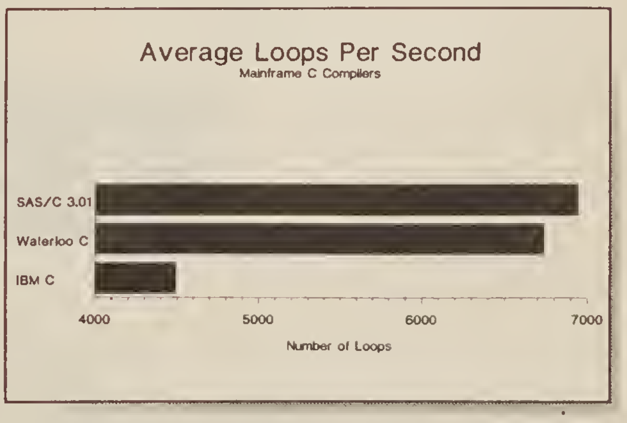

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Share chief

CONTINUED FROM PAGE 93

Cowles, who was elected president in August. Share, which serves about 1,700 IBM customer sites, is one of two major U.S.-based users groups for large IBM systems along with Guide International Corp.

Cowles, who attended her first Share meeting in 1973 and most recently was vice-president, is an assistant director in charge of special academic projects at Cornell University. In that role, she has managed the installation of $8 million worth of equipment donated to the university by IBM during the past three years. A Montana native who majored in history at the University of California at Los Angeles, Cowles has served in computer-related roles at Cornell for almost 20 years.

Despite her early reorganization moves, Cowles said that Share does not require much change, because it was running well when she took over. She ran unopposed for president and thus began her planning in early summer.

"It wasn't like saying, 'Boy, there's something wrong here and I'm going to fix it.' Share is a very successful organization, so it was just a matter of thinking about what things we wanted to focus on," she said.

"The days of the high priests of computers are getting to be over with," she continued. "So we are trying to deal more with people who help others use computers. There is no way that you can reach all of the end users, but the people who are training end users and helping them do their work are of a lot of interest to us."

Lighten the load

Cowles took steps to relieve Share's overworked director of divisions — a position she likens to that of chief operating officer — of some logistical responsibilities. Tasks such as dealing with hotels at meeting sites and predicting attendance will now be spread out among more directors.

Cowles noted that attendance at the semiannual meetings exceeds 5,000 people and that Share tries to be conservative in predicting attendance. This prevents the group from overestimating and thus losing money on meetings.

She also has worked to improve the technical program's response to changing member concerns.

"We collect information from our members about their concerns in various ways, and we look at it when we are developing a strategic plan. But it's not easy to integrate the concerns into the program very quickly. So I wanted that to be an area where we had some focus," she said.

That information comes into Share and is acted on at varied points. The board of directors looks at issues from a strategic point of view, while participants in the technical programs and the members at large may need immediate response.

"People who are coming to Share know full well what they need in their jobs, and we also need to be responsive to them when they say, 'Hey, this is an area that seems to be getting a lot of attention around here. I need information on it.' So there is sort of a middle ground where you both listen to the people who are coming to your conference and you think about what's going on in the environment and try to come up with a relevant program," she added.

Share's Cowles

Share is also now focusing on its own computers. "It's interesting being the kind of group we are — sort of shoemaker's children in terms of using automation ourselves," Cowles said. The organization is using an IBM 9370 to automate its agenda, manage electronic conferencing and organize the information gathered at technical sessions.

Cowles said there has been no shortage of volunteers to pick up additional responsibilities.

Subtle differences

Differentiating Share from Guide, Cowles observed that Guide focuses more on management issues while Share takes a more technical bent, even if the attendees themselves are managers.

Asked about the type of person who attends a Share meeting, she said, "Maybe technologist is a good word, because a lot of our people are not systems analysts anymore. They are sort of the right hand of God in their organization, the guy who tells the chief information officer where technology is these days."

She reported that she had no complaints about the relationship between IBM and Share and added that IBM has helped Share by sending large numbers of IBM technical experts to Share meetings.

Those experts can then hear Share members raise their concerns directly. They are able to address those concerns sooner than if they waited months for Share to compile its list of requirements for IBM.

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Rooney turns DP

CONTINUED FROM PAGE 93

community college, worked summers as a hall of fame attendant and was inducted as the hall's first full-time computer professional in 1985.

From his cluttered office in which *Applied C* competes for bookshelf space with *The Baseball Encyclopedia*, Rooney heads a one-man operation, shepherding the repository of baseball's colorful history into the computer age. He faces the same challenge as many large MIS shops: reluctant end users.

"When I first started in the business, no one knew the extent to which you could make a computer work for you," Rooney says. "Here, my problem is that I know, but my people really haven't always had exposure to it. In any operation, that's probably the single biggest problem. People still don't have a real good understanding of what a computer can do."

What do computers do at the hall of fame? Plenty now, including the traditional DP functions of payroll and accounting, and they will do much more in the future. Rooney has ambitious automation goals for the hall and the adjoining National Baseball Library, in which researchers and afficionados from around the U.S. comb files for everything from arcane statistical measures to obscure minor league histories.

One of Rooney's ongoing projects is the creation of a database for the more than 24,000 baseball artifacts that have been donated. That information, currently stored in manual ledger books, requires constant updating as the hall receives thousands of new items each year.

Last year's donations, for example, ranged from the cap doffed by Hank Aaron after he clouted his 715th home run to a Brooklyn Dodgers usher's jacket worn at Ebbets Field in the 1950s.

> "IN ANY OPERATION, that's probably the single biggest problem. People still don't have a real good understanding of what a computer can do."
>
> PATRICK ROONEY
> BASEBALL HALL OF FAME

Rooney takes special pride in the two IBM interactive screen exhibits and with good reason — they helped him get hired. As a hall of fame attendant, Rooney had offered his advice on where the hall could computerize.

When IBM later offered to set up the interactive exhibit but needed help from an in-house professional, Rooney was in the right place at the right time.

"The mission of a museum is part educational, and the interactive exhibit adds to that," he says. "That's where the computers can really improve the means of accessing this part of American history, which is, in essence, folklore."

Hall directors say the IBM exhibits are the most popular attractions for the hall of fame's more than 200,000 visitors every year. The interactive technology is also currently used in Ford Motor Co. dealerships, the Smithsonian Institution and several state parks.

"The computers have been a marvelous addition," says William Guilfoile, the hall's associate director. "Pat was really instrumental in that whole effort with his contacts in IBM and his knowledge. I don't know what we would have done without him."

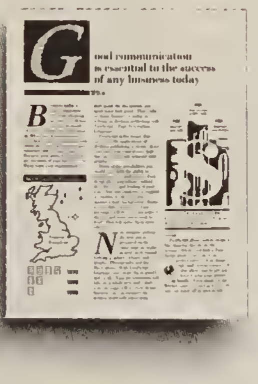
Rooney was particularly busy this month as he showcased a traveling demonstration of the interactive exhibit at the playoffs and World Series. This year, he had to take extra precautions to hide his affinity for the New York Mets. "We're supposed to be neutral around here," he says.

The picturesque village of Cooperstown preserves itself as well as the sport that made it famous, and the country lifestyle suits Rooney. "It's the first time I've lived and worked in the same town," he says. "It's a great community."

On weekends, the 54-year-old father of three spends most of his time caring for his 15-acre property and helping his wife run a recently started bed-and-breakfast in their home and, of course, watching a little baseball.

BOB MAHONEY/PICTURE GROUP

Rooney *and the old neighborhood*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TEXAS INSTRUMENTS

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Budget

FROM PAGE 1

another 20% to 25% out of the budget," Karney says.

Another of the many U.S. companies that were once the target of an unfriendly takeover is Burlington Industries, Inc. in Greensboro, N.C. MIS spending at the textile company is down, although the figures are not finalized, according to E.R. Fishburne, director of corporate information systems.

Southland's Karney

Burlington, which opted for a friendly acquisition by Morgan Stanley & Co., faces another two or three years of tight budgets as it pays off more than $2 billion in debt incurred during the takeover battle.

Burlington's recovery has involved work force reduction and the sale of several divisions, but the MIS spending slump is a broader issue, Fishburne notes.

Paying the debts has meant looking for savings. "We were fortunate. Some of our mainframes were coming off lease, so we took the opportunity to recast some leases and save some money. We've taken some steps to reposition ourselves in maintenance mode," Fishburne says.

"I think that in information systems there is an effort under way to tighten belts. I'm not just talking about our company or the textile industry but all industries," Fishburne says.

The MIS budget at clothing maker Levi Strauss & Co. in San Francisco will show a small decline after allowing for inflation, says Chief Information Officer Bill Eaton. At the same time, however, the company is trying to make investments that it views as strategically important, he says.

"We're getting some of the things out of the budget that may have been important in the past and substituting things of strategic value," Eaton says. He did not specify what will be cut.

One strategic thrust is improving services to customers, namely implementation of the Levi Link system to be used by retailers to order clothing. That is related to the other areas of emphasis: using point-of-sale (POS) information to tailor production to demand and computer-integrated manufacturing. "As you bring a tremendous amount of point-of-sale information into the company, it drives manufacturing," Eaton says.

Such strategic thrusts lead to demand for equipment, and "we will absolutely make those investments," he adds. The company may upgrade a mainframe next year, depending on how fast it rolls out Levi Link.

At Fleet/Norstar Financial Group in Providence, R.I., formed this year by the merger of New England and New York banking companies, managers are taking drastic action. In drawing up the new organization's first consolidated budget, they aim to cut DP spending 20% from last year's combined expenditures.

The centerpiece of the effort is the consolidation of four data centers into one in Albany, N.Y. While the move is aimed at eliminating the redundant facilities and applications in the wake of the merger, "it would still be a worthwhile project" without a merger, says Michael Zucchini, the company's executive vice-president and CIO. He cited a general trend toward cost reduction in the banking industry.

The data center consolidation is leading to a reduction of about 150 positions in the data center work force. About half the cutback is coming through attrition, the rest through layoffs. Systems and programming staffs will continue to work in various locations and be reduced only through attrition, Zucchini says.

Another company that cut its MIS budget is Comfed Savings Bank in Lowell, Mass. Paul D. Keenliside, senior vice-president of information systems, says Comfed, as a mortgage bank, is in the same situation as much of the financial services industry hurt by the October 1987 stock market crash.

"Our budget has been reduced for the coming year, and we have had to make some tough decisions. We haven't lost any people, but we have had to cut back with steps such as foregoing enhancements on very stable software products," Keenliside says.

Grange's Ridgway

One of Comfed's cost-saving steps was to perform a detailed analysis of maintenance costs. The company used basic analysis tools to take a close look at how much it has been spending on maintenance and what types of equipment have been reliable enough to be removed from the maintenance cycle.

"Obviously, we wouldn't take a CPU off maintenance, but when you have a [solid-state storage device] that hasn't failed in three years, and the only moving part is a fan, you look at whether you can get by without maintenance," Keenliside says.

While Comfed focused on savings in the operations area — such as a data compression technique that saved the cost of new disk drives — the bank tried to avoid cutting back on user support, particularly in cases in which users are developing their own strategic applications.

While some industries and firms are on downward spirals, 1989 is the recovery year other MIS executives have been awaiting. "It looks better than the past five years for the insurance industry, particularly property and casualty.

Making users pay to play

There is one straightforward way to justify your MIS budget: Charge users for services. Justifying the budget is enough reason for many information center managers to institute a charge-back system instead of grappling with the often tricky task of justifying the benefits of automation to top management each year.

An information center operated as a profit center is also more likely to provide better service to end users and to respond more quickly to demands of individual departments, says John Dubiel, a system assurance division leader at Boston Edison Co. in Boston. "We're getting to be functionally more like consultants, and that is probably healthy," Dubiel says. "It was a no-win situation when we administered the budget for the whole corporation," he adds. "Now, each department sets its own budgets."

In a *Harvard Business Review* article early last year, the University of Virginia's Brandt Allen pointed out that in a profit center, the budget-setting process is simplified because end users, and not information center management, set the budget. The process also provides a basis for measuring both efficiency and effectiveness, he says.

Charging for information center services helps to clear away backlogs, says Dave Douglass, editor and publisher of the "IC Strategist," a newsletter covering information center management trends and issues.

"When information centers become backlogged with project requests, you have to decide which projects to undertake and which to put on a back burner or to reject altogether," Douglass says. In a charge-back operation, some of that responsibility is passed to end users, he adds. If the project is important enough, they will pay to have it done.

Not all information managers are convinced that charging for their services is an alternative to justifying their budgets, however.

In many instances, individual departments in some corporations simply refuse to take the added burden of attempting to calculate what their costs for automation will be each year. Also, some information managers fear that the information center will simply become complacent because it has a captive audience. "With small budgets it's hardly worth the effort. The cost per user is too small to be meaningful," says Dennis Davidson, manager of data processing at Continental & Conveyor Equipment in Winfield, Ala.

MICHAEL ALEXANDER

Gillette's close shave

Two years ago, corporate MIS managers at Gillette Co. thought they were on top of their budget for the coming year. Then takeover artist Ronald Perelman struck, floating a $65-per-share offer for the company's stock.

Management rejected the offer and in November 1986 paid Perelman a premium for his shares, prompting the price to drop to $45. Analysts cried "greenmail," and shareholders filed lawsuits.

To boost earnings and the stock price, top management moved to restructure in December. Gillette's corporate MIS group had to apply a guideline to its Systems Planning and Research department and its own administrative expenses to reduce corporate overhead by 10%. Early in the year, MIS executives had to revise their 1987 budget.

In addition to running the planning and research organization, the corporate MIS group provides communications, support and standards for decentralized DP within the company's worldwide manufacturing empire, billing business units for equipment and services. "We follow the businesses while at the same time try to lead them to new technologies," says Joseph Cloonen, controller for the corporate MIS group. Last year, the company spent about $80 million on MIS — 2.5% of revenue — and supported 6,500 personal computers and terminals.

MIS scaled back operations and development according to the demand from the restructured lineup. The group typically advises the business units on budget priorities.

In streamlining the activities it controls directly, the corporate MIS group made its top priority maintaining investment and support for strategic systems, "which is to say those related to sales and manufacturing," Cloonen says. It continued work on systems for salespeople, which have since been deployed.

The group cut back on consultants, conferences and testing and deferred "things of secondary nature not cost-justified or considered crucial to business," Cloonen says.

Managers cut the MIS group's staff by 9%, the same amount by which they lowered their overall spending and by which the company reduced its total work force. The MIS managers accomplished some of the reduction through attrition, but most of it required layoffs.

Along with continued investment in the future, the managers were particularly concerned with maintaining the group's "skill set," Cloonen says. "Sometimes future turnover is a bigger concern than the people affected directly," he says. Managers tried to assure remaining workers that the restructuring was a temporary measure through honest communication, particularly by emphasizing the underlying need to focus on core business, Cloonen says.

DAVID A. LUDLUM

"For the past five to eight years companies have shown losses for property and casualty, but 1988 was a comeback year, and 1989 looks like a continuation of that with some profits," says Michael Ridgway, director of data processing at Grange Insurance in Columbus, Ohio.

Ridgway, noting that insurers still tended to show profits even during the slow years for property and casualty lines of business, recently began the budget process for the fiscal year that starts Jan. 1. He expects his 35-member group to be like most departments and show a general budget growth of 8% to 9%.

Such growth may not mean significant staff additions, but it could mean a few more jobs and some promotions, with the most likely additions coming in the areas of communications hardware, systems software and mainframe storage.

Looking at his industry overall, Ridgway notes that systems groups should survive the serious cutbacks even during bad years. "Companies that see information technology as a competitive weapon, as insurance companies do, do not necessarily short MIS during the lean years," he adds.

Ridgway says that when cuts do occur, they are most likely to come through curtailed training and equipment purchases.

At another insurance firm, Prudential Insurance Co., the 1989 MIS budget is expected to grow, matching a growth in demand for processing power. But Kirke Bent, vice-president of equipment and software planning at Prudential in Roseland, N.J., notes that the projected 1989 growth is fairly typical.

"We work as a utility, providing services to the various business groups, so we don't get a directive that says we can only spend so much on data processing or that we can only allow people to spend so much on DP," Bent says.

He notes that the independent business units work out their own business plans and estimate the computer support they will need.

Bent says that Prudential expects some mainframe hardware upgrades but that the company can meet the growing computer power demands at minimal cost because of improved price/performance levels.

Montana Power's Griffith says he is facing a relatively flat 1989 budget. That is in line with the typical slow-growing revenues of utilities and reflects an absence of major capital expenditures following the purchase of two CPUs in the past two years, he says.

A priority in next year's budget is the implementation of Montana Power's Customer Information System, which Griffith calls "absolutely strategic." Five years in the making, the on-line billing system lets meter readers input data at 11 divisional offices. It also allows customer service representatives in those offices to call up account files when answering questions and update them when bills are paid at the offices.

About 70% of Montana Power's computer services budget reflects the DP organization's plans; the other 30% goes to users' requests for equipment and services. Top management dictates a limit on the total. The centralized budget allows more economical purchasing, while the limit on the total "helps DP managers say no" to users, Griffith says.

The slow retail sales environment is containing budget growth at Murry's, Inc., an East Coast retailer based in Forestville, Md. "We're not doing much in the way of expansion in terms of hardware or capacity," says Assistant Controller Martin Rosenhaft.

The company will not expand the DP staff, but it will push ahead with major development of a POS system intended to speed up daily reporting by stores, improve inventory control and help stores order from the distribution center.

"Based on historical information and current information on promotions, it will know the optimum order for each store," Rosenhaft says. "It knows what is in inventory and what it is going to sell over a short period of time."

Ronald G. Sutton, vice-president of data services at Murry's, says he will get help putting the budget together with a general ledger package purchased from the investment banking firm Salomon Brothers, Inc. It can download data from a mainframe to a personal computer, allow it to be analyzed and generate graphics, he says. "It will do a lot of analysis, what-if type things you could do on a spreadsheet if you wanted to write all the formulas and equations," Sutton says.

Comfed's Keenliside

At Southland, which is best known for its 7,500 7-Eleven food stores, the leveraged buyout has meant divestiture and repaying debt. The early cuts meant layoffs in MIS and other departments, but Karney emphasizes that no more layoffs are expected.

Some of the savings Karney is looking at are in the area of applications development, in which discretionary projects may be put on hold for a year or sometimes longer.

"It's not a fun thing to do, but if you have to you can survive for a few years before it catches up to you," he says. "The things we really need now, we have figured out a way to fund."

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COMPUTER INDUSTRY

INDUSTRY INSIGHT

Clinton Wilder

Confusion rules over the realm

An unlikely computer industry expert, Art Buchwald, recently delivered one of the best comments on the state of the industry circa October 1988.

At the annual Alex Brown & Sons conference for computer industry investors two weeks ago in Baltimore, Buchwald prefaced his luncheon speech of political one-liners with the following gem: "After listening to you guys talk about your business for the past half hour, I can see why you hired a humorist."

Something is rotten in the kingdom of silicon, and it's reflected by the information processing industry's investors and customers alike. It is not just the wave of disappointing third-quarter financial results pouring over the transom, but something more pervasive.

At the Alex Brown conference and at the biannual ADAPSO management conference in Dallas last week, one word echoed again and again in discussions about the marketplace: confusion.

Ashton-Tate Chairman Edward Esber, in his company's question-and-answer session at Alex Brown, broke it down into three categories: political/economic confusion, industry confu-

Continued on page 104

Palsied profitability

Third-quarter earnings reflect industry woes

BY NELL MARGOLIS
CW STAFF

Beset with overcrowded market niches, intensifying competition and a conservative market mentality, the computer industry slogged its way through the long, hot (and not so hot) summer with generally disappointing results, as reflected in third-quarter earnings announced last week.

"I wish the market were stronger," said Timothy McCollum, an analyst at Dean Witter Reynolds, Inc., who referred to last week's computer company numbers and prospects as "a really mixed bag, with a weighting toward the negative."

Falloff in domestic orders reported by **Unisys Corp.** and **NCR Corp.** were seen as further harbingers of the industry-wide slowdown so often predicted during the past several months. The declining orders offset any optimism that might have been gleaned from the companies' respective revenue and profit gains.

Unisys reported third-quarter revenue up a scant 2% to $2.27 billion and net income of $151 million, a 16% increase over last year's comparable period.

Revenue at NCR crept up 6.9% to $870.2 million, while the company's net income rose 5.4% to $103.1 million.

In a prepared statement, Unisys Chief Executive Officer W. Michael Blumenthal saluted the company's earnings and laid the overall underwhelming numbers partly at the door of customers whose wallets remain closed as they await Unisys' new 2200 line, scheduled to ship in volume next spring.

However, citing a weak U.S.

Continued on page 106

1988 third-quarter earnings

Sighs at Lotus, highs at MCI, and Apollo starts the long climb back to black

	Revenue July through September (in millions)	Percent change from 1987	**Net income** July through September (in millions)	Percent change from 1987
Altos	$32.2	(21)[1]	$4.1[2]	86
Apollo	$157.1	16	($3.6)	(25)
Apple	$1.17B	49	$107.9	51
Computer Associates	$223.7	33	$28.9	81
Excelan	$17	70	$1.3	9
Lotus	$116.8	15	$14.3	(25)
MCI	$1.36B	36	$99	482
Microsoft	$176.4	72	$36.6	72
NCR	$870.2	6.9	$103.1	5.4
Sequent	$20.6	110	$1.7[3]	113
Silicon Graphics	$44.3	53	$1	(67)
Software Publishing	$23.9	123	$4.3	187
Tandy	$937	12	$64.9	1
Unisys	$2.27B	2	$151	16
VM Software	$9.7	61	$0.9	422
Wang	$723.1	4	$13.1	(42)

[1] Parentheses indicate decrease or loss

[2] Includes $5.7 million net gain from one-time sale

[3] Includes extraordinary credit of $270,000

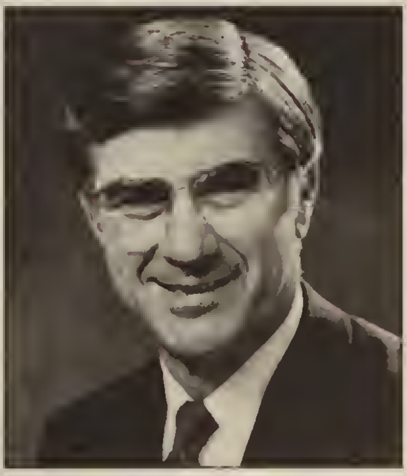
CW CHART

Pansophic fills void left by CA consolidation

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Pansophic Systems, Inc. announced annual revenue of $165.3 million at its recent annual meeting here — a number that ranks the Oak Brook, Ill.-based company solidly in the second tier of software providers, alongside the likes of Cullinet Software, Inc., Cincom Systems, Inc. and McCormack & Dodge Corp.

In fact, Pansophic Chief Executive Officer David J. Eskra laid claim to the No. 3 spot in the independent mainframe systems software market.



Pansophic's Eskra

"There's a lot of consolidation going on around us," Eskra said. "We've gone from being No. 5 to No. 3, because No. 1 [Computer Associates International, Inc.] knocked everyone else out of there." Computer Associates purchased Applied Data Research, Inc. (ADR) from Chicago-based Ameritech for $170 million last month. ADR had $172.9 million in revenue last year.

While Pansophic's revenue for the year ended April 30 was 44% higher than 1987's $114.6 million, net income for the year fell 6% to $15.7 million. Company executives blamed the dip in profitability on unexpected losses of about $6 million in the October 1987 stock market crash.

Eskra said Pansophic has since decided to keep all its investments in cash, money markets or certificates of deposit to avoid another such loss. "We're out of the attempt to manage securities," Eskra said. "Our current investment strategy calls for the most conservative use of money we gather through revenues."

Some of that cash might be used to continue Pansophic's string of acquisitions, which

Continued on page 104

Inside

- Telxon makes peace with MSI Data, Symbol Technologies. Page 110.
- Honeywell and Unisys recite the "Sue Me, Sue You" refrain. Page 111.

Words of mouth

Following are some choice quotes from software and services executives at Alex Brown & Sons' annual computer industry investment conference:

"You can move the data, you can move the macros. But the most expensive thing of all to move is the user."
Robert Schechter, chief financial officer, Lotus Development Corp., on migrating from one spreadsheet program to another.

"I think the rumors are a bunch of bull. People just like to write that stuff because it sells papers."
Schechter on rumors of programmer defections from Lotus.

"[Lotus] will have a problem with expansion RAM if the chip prices don't come down next year."
Jon Shirley, president and chief operating officer, Microsoft Corp., on the system demands of 1-2-3 Release 3.0.

"The toughest competitor at all times is the customer's belief that he can do it himself."
David Campbell, chairman, CEO, Computer Task Group, Inc.

"The problems are in our direct selling, not in our products."
Jack Berdy, chairman and CEO, On-Line Software International, Inc., on On-Line's financial downturn.

"I'm proud to say that none of us have any previous AI background."
Dennis Yablonsky, president and CEO, Carnegie Group, Inc., on Carnegie's top management team.

"Our newer technology is like a chameleon; it changes color to fit the customer. That's more of a concept sell, and it's tough to do over the phone."
Mario Morino, chairman and CEO, Morino Associates, Inc., on Morino's switch to more direct selling.

"I don't think we've adequately conveyed our strategy to the MIS community."
Edward Esber, chairman, CEO, Ashton-Tate Corp.

"Our relationship with Microsoft and Novell is stronger than ever. It's like in any marriage — you get through some tough issues, and you get stronger."
Esber on Ashton-Tate's recent highly publicized cancellation of Novell's marketing agreement for SQL Server [CW, Oct. 3].

"IBM still can't sell software."
Richard Earnest, president, VM Software, Inc.

Wilder

CONTINUED FROM PAGE 103

sion and stock market confusion.

The first refers to the uncertainty prevalent in any presidential election year, particularly one in which a sitting president is not up for re-election. But exacerbating that situation is the oft-predicted economic mess, thanks to the huge U.S. budget and trade deficits, waiting to greet the next White House resident. The pundits say a Democratic victory will bring us a recession sooner, but it won't last as long, while the Republican recession will come later but will be longer and deeper. Or is it the other way around?

Now I'm confused too.

The industry confusion stems in large part from the ongoing battles over what was supposed to be the industry's savior: standards. Last week, AT&T, Sun Microsystems and company made it official — Unix System V is the Unix they like, and they won't be joining forces with the folks who formed the Open Software Foundation to develop a rival standard to System V in the first place. Surprise, surprise.

To relate the industry confusion to the political, let's recompile the most memorable political moment of 1988. It's like AT&T saying, "I've known Unix a long time. I serve my customers with Unix. Unix is a friend of mine. OSF, you're no Unix."

Then there are the microcomputer standards rivalries cited by Esber — DOS vs. OS/2 and IBM Micro Channel Architecture vs. Extended Industry Standard Architecture — not to mention the graphical user interface (that's GUI, pronounced "gooey") legal quagmire among Apple, Microsoft and Hewlett-Packard. If users are confused, who can blame them? "If I am a customer," one leading analyst told *The Wall Street Journal* in reaction to the Unix situation, "my head is spinning."

> IT'S LIKE AT&T saying, "I've known Unix a long time. I serve my customers with Unix. Unix is a friend of mine. OSF, you're no Unix."

Computer industry investors don't exactly feel like they're on solid ground either. One year after Black Monday, the stock market itself is confused, and technology stocks have borne the brunt of that.

Investors in DEC, for example, were burned badly in the crash and have continued to bail out of the stock. But more generally, high-tech companies, except for traditional blue chips like IBM and HP, really need a different breed of investor — those willing to experiment. That was much easier to do in the raging bull market of the mid-1980s.

In the era of market uncertainty that has followed Oct. 19, 1987, the investment community is much less willing to take the technology plunge. It would much rather play takeover stocks like Kraft, which netted its shareholders a cool $28 per share spread in one day last week when Philip Morris launched a takeover bid.

Even Alex Brown's analysts, preaching to the converted, had to admit the facts: technology stocks have been the worst-performing sector in the Standard & Poor's 500 since the crash. Alex Brown's Ken Burke cited factors such as IBM's product-line transitions and the flagship product delays of Lotus and Ashton-Tate, but most investors are growing short on patience.

And so is the MIS community. More and more big shops are narrowing their vendor lists, trying to at least limit the choices they must make in one area while their expanded strategic role bombards them with more and more choices elsewhere.

Vendors warring over who controls standards won't help them do their jobs. Maybe common sense, resulting in less confusion, will.

Wilder is *Computerworld*'s senior editor, computer industry.

Pansophic

CONTINUED FROM PAGE 103

brought 17 smaller businesses into the company last year. "Our bent has been to buy where we feel that's the best way to bring products to market faster," Eskra said. "There are other long-term benefits, as well, including [the addition of] large customer bases and different distribution channels."

Product development has met with several setbacks from software bugs, Pansophic President William G. Nelson said. Some invaded the 1988 release of the Telon computer-aided software engineering application generator and caused the company to revise Telon even though sales were up 82% in 1988. To fix the problem, Pansophic released a new version, Telon 2.0 C, this month and replaced the top managers on the Telon development team in Quincy, Mass.

Pansophic's five divisions are growing at different rates, company executives said. The fastest growth is in the new Graphics Products division, where sales tripled last year.

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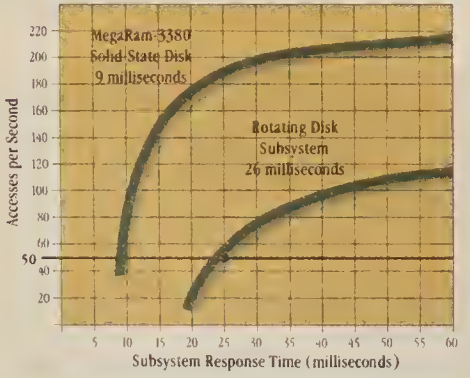

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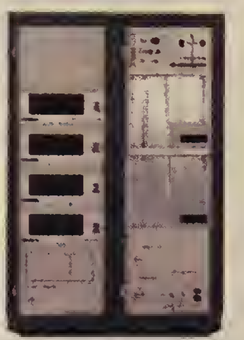

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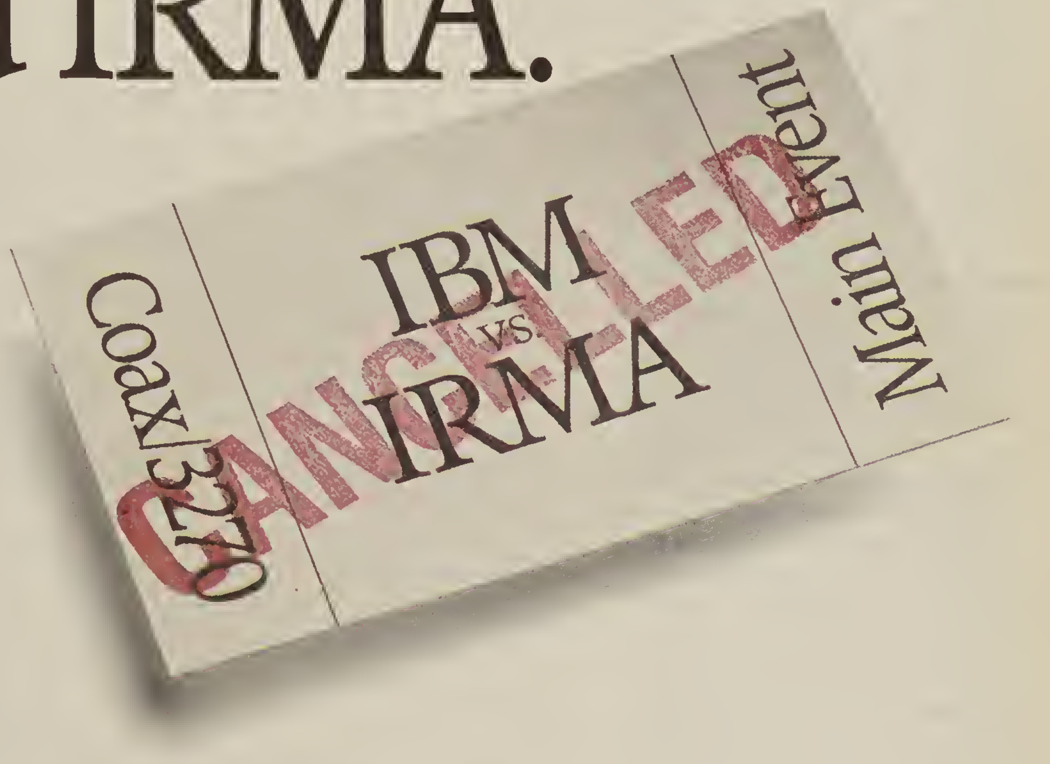

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Palsied

FROM PAGE 103

computer market, a tight U.S. defense budget and a strong U.S. dollar, he also trimmed Unisys' growth projections to single-digit revenue.

If last week's earnings barrage failed to reveal a boom at the top, there also was no joy in Mid-ville. **Wang Laboratories, Inc.**, besieged by competition not only from traditional rivals but also from the burgeoning forces of workstation suppliers, enjoyed a modest 4% revenue rise but saw earnings barrel downward 42%. Moreover, a company spokesman confirmed that the increase in revenue was attributable entirely to international sales, with revenue remaining flat on the domestic front.

Slip and slide

Wang's earnings slide came as no surprise to analysts, most of whom have long been forecasting third-quarter disaster in the minicomputer market. Marginally hopeful was the report from **Apollo Computer, Inc.**

Apollo looks like a possibility for the comeback trail after a disastrous second quarter. But, cautioned Dean Witter's McCollum, "they have a lot to do and a very long way to go before they turn around." Apollo reported third-quarter revenue up 16% and a net loss of $3.58 million — a recovery from the company's $7.9 million second-quarter loss, but nevertheless a 25% greater falloff than the $2.7 million deficit reported in third-quarter 1987.

"Apollo continues to face severe competition from Sun, and it will get a lot more intensive if DEC and IBM get their [workstation] acts together," McCollum said. Apollo, he noted, faces a need to strengthen its marketing forces — a move that could retard the company's efforts to get back in the black.

As was widely predicted, bright lights shone mainly in the microcomputer cosmos. **Apple Computer, Inc.** chalked up its 10th-consecutive quarter of increasing earnings and profits. Powered largely by the Macintosh's success in the commercial sector and aided by the Apple IIGS's inroads in the education market, Apple reported an impressive 49% revenue surge and an even larger leap in profitability, with net earnings up 51%, according to Apple CEO John Sculley.

A "long-standing commitment to development of products for the Apple Macintosh environment," said **Microsoft Corp.** President Jon Shirley, emerged as a major factor underlying his own company's continuing rosy health. The Redmond, Wash.-based software company's 12th-consecutive quarter of sales increases was partly because of third-quarter introductions of Mac-oriented software and Version 4.0 of Microsoft's MS-DOS operating system, Shirley said.

Meanwhile, Mountain View, Calif.-based **Software Publishing Corp.** netted triple-digit percentage increases in both sales and profits, credited in large part to the continuous flow of new products, said Peter Rogers, an analyst at Montgomery Securities.

Software Publishing "is doing a very good job of serving niches neglected by the Big Three," that is, Microsoft, Lotus Development Corp. and Ashton-Tate Corp., Rogers noted.

Even in the personal computer sector, however, warning notes sounded of hard times to come. San Jose, Calif.-based **Altos Computer Systems, Inc.** President Dave Jackson blamed "a general slowdown in our domestic business" for an 86% decline in earnings.

"There's a perception out there that unit demand for PCs is decelerating," Rogers said.

Other items from the mixed bag of earnings include the following:

Silicon Graphics, Inc. and **Sequent Computer Systems, Inc.** Last spring, when supercomputer workstations first hit the headlines and the concepts of reduced instruction set computing and parallel processing were pushed center stage, one frequently asked question was, "how much of a market is there for these super-speed MIPSters?" Last week, the answer ap-

Theirs.

The second most reliable impact printer did this much before it stopped. It wound up in the repair shop after 7,000 hours or ten months of printing.

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peared to be "at least enough to send sales soaring at both these companies, although Silicon Graphics' earnings fell."

Sequent CEO Casey Powell credited the Beaverton, Ore.-based company's stellar earnings and profits surges to increasing market awareness, particularly in the commercial market. Silicon Graphics CEO Edward McCracken blamed heavy research and development investment in its Iris Power series of multiprocessor three-dimensional graphics workstations for the company's 67% earnings decline in the face of its 53% revenue rise.

Slow but sure

AST Research, Inc. Slow summer sales and significantly increased R&D and marketing investments in next quarter's scheduled product introduction kept results lower than originally predicted by the Irvine, Calif., micro systems and peripherals maker. Nevertheless, AST announced that revenue climbed 38% from the comparable quarter last year; profits jumped 325% but were still quite low at $306,000.

VM Software, Inc. In a boast that few could make this quarter, CEO Robert Cook said that the Reston, Va.-based systems software purveyor to the IBM VM operating system market "enjoyed continued domestic and international growth this quarter." VM Software's third-quarter revenues bounded up 61% to $9.7 million, while net earnings grew 422% to $942,176.

Lotus' earnings falling

CAMBRIDGE, Mass. — Lotus Development Corp., dogged by a series of delays in the vaunted Release 3.0 of its flagship 1-2-3 spreadsheet product, announced a 25% earnings drop for its third quarter ended Oct. 1.

Net income for the beleaguered firm, which during the past quarter could neither get its product out nor keep its employees in, fell to $14.3 million from $19.1 in last year's comparable period.

But for the tax man, the picture would have been bleaker still: According to Lotus, quarterly earnings were favorably affected by a 3% reduction in its estimated annual effective income tax rate. Third-quarter revenue rose 15% to $116.8 million.

"Release 3.0 — when it comes — is going to be a very good product," Paine Webber, Inc. analyst Bob Therrien said. However, he added, a well-received 1-2-3 entry, even without the delays, will not solve Lotus' problems.

"The worst thing that ever happened to Lotus," he said, "is that customers began to call the 1-2-3 spreadsheet Lotus; they became a one-product company by default. Almost every diversification effort Lotus has undertaken has been either disappointing or unprofitable."

In a prepared statement, Lotus Chief Executive Officer Jim P. Manzi manifested optimism and hinted at new directions. Citing Lotus' continuing ascendency in spreadsheets, Manzi also alluded to "leading market share positions in . . . integrated software, graphics and in the delivery of information on CD-ROM."

In the quarter just ended, Manzi said, Lotus entered the personal information management market with its Lotus Agenda software.

Additionally, he said, "We have more than 10 new products under development for shipment in 1989 and 1990."

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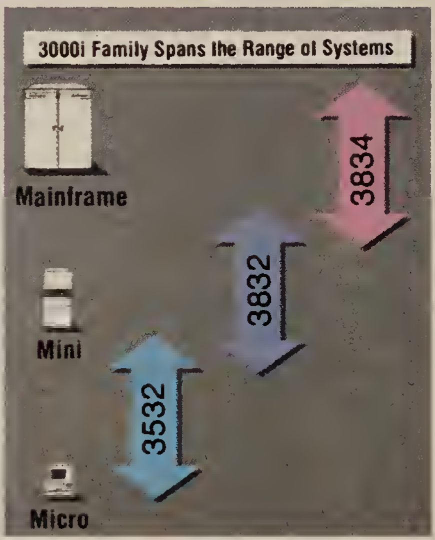
The 3000i records on industry standard 3480-type cartridges, each with a formatted capacity of 320 megabytes. An optional 10 cartridge stacker increases total storage capacity to 3.2 gigabytes. There are 2 different 3000i series with 26 models in all. The series with an 8-inch form factor is the world's first tape drive system to address the size and high performance needs of workstations, midrange systems and small mainframes. The 5 1/4-inch form factor series will complement the economy and performance of micros and low-end minis.



What about backup speed? Transfer rates range from 242 to 896 kilobytes per second. For instance, a Cipher 3000i drive, using only 2 cartridges, can backup a 500 megabyte disk in just 11 minutes. A high performance GCR open reel drive takes 4 reels of tape and twice the time to do the same job.

The 3000i offers a choice of configurations including horizontal or vertical mounting, tabletop and 19-inch rack mount versions. System integration couldn't be easier with a wide selection of interfaces—Cipher/Pertec, SCSI and IPI-3. AC or DC power. And standard 9-track reel-to-reel functionality is a special feature of the 3000i. This ensures compatibility with existing system software and protects the enormous investment in software development.

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Telxon, MSI reach settlement

BY NELL MARGOLIS
CW STAFF

AKRON, Ohio — Telxon Corp. chose peace and profits over costly litigation and a potential bidding war last week and signed a settlement agreement that will resolve all outstanding issues between Telxon, takeover target MSI Data Corp. and Symbol Technologies, Inc. — the company that will now acquire MSI.

Under the agreement, Telxon and MSI — the top two contenders in the handheld computer market — ended the barrage of suits and countersuits that were piling up over patent disputes and sealed the accords with a five-year, $40 million supply and license deal among the companies.

"My bottom-line comment on this is: Be happy," said Henry Jicha Jr., an analyst at Wood Gundy Ltd. The Telxon/MSI/Symbol agreement, Jicha said, spells out good news all around.

Telxon will pay MSI $3 million to settle pending patent claims; MSI will pay Telxon $3 million to settle pending unfair competition claims; and Telxon, in conjunction with the agreement, is backing off its $17-per-share tender offer for MSI and allowing Bohemia, N.Y.-based white knight Symbol to carry off the prize at $20 a share. Telxon will also pay MSI $37 million up front as prepaid royalties for the license of the patent that stood at the heart of the recent bitter litigation.

Telxon also agreed to buy a minimum of $40 million worth of laser scanning products from Symbol during the next five years. The deal makes Symbol the prime supplier of market leader Telxon, Jicha said. "At the same time, it assures Telxon its supply over the next five years. Everybody's walking away from this happy as clams at high tide," he added.

The stated price under the supply agreement is significant, Jicha said. "Telxon will have to grow their business by approximately 25% annually in order to make that $40 million payment," he said. "That should tell you something about what they think growth will be."

IN BRIEF

Who needs it?

Who needs one more supercomputer company? The state of **Washington** does. Governor Booth Gardner and University of Washington President William Gerberding joined in a news conference last week to formally welcome **Tera Computer Co.** to its Seattle home. The newly formed company's decision to build "the next generation of supercomputers" from a Seattle base, said company President Jim Rottsolk, was aided by proximity of a major research university with a strong computer science program and a willingness to work with the commercial sector.

. . . .

Who needs it? Part II

Who needs one more Benchmark extravaganza? **Apollo Computer, Inc.** does. Having shipped its Series 10000 Personal Supercomputer last month, the Chelmsford, Mass.-based workstation manufacturer last week invited users of two rival workstations — Sun Microsystems, Inc.'s Sun 4/260 and Digital Equipment Corp.'s VAX 8800 — to run their applications on an Apollo 10000 and announce their comparisons. The "Series 10000 Challenge" will run the first two weeks of next month at Apollo's East and West Coast headquarters.

. . . .

Artful dodgers

Who else needs one more supercomputer company? Too many potential acquisitors for comfort, according to **Alliant Computer Systems, Inc.** So the Littleton, Mass.-based minisupercomputer manufacturer is shoring up its defenses against what President Ronald Gruner called "the current climate of hostile and potentially abusive takeovers." Last week, Alliant adopted a shareholder rights plan under which preferred stock purchase rights will be distributed as a dividend at the rate of one right per each share of common stock held at the close of the business day on Nov. 1.

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Fast friends

West German computer company **Nixdorf AG** last week signed on to market workstations from **Apollo Computer, Inc.** worldwide. While both companies have agreed not to specify the contract price, an Apollo spokesman confirmed that the agreement is a multimillion-dollar deal. Apollo and Nixdorf touted the deal as reflecting their mutual dedication to international standards and open systems. In one way at least, it undisputably does: The companies became friendly, according to the Apollo spokesman, while helping to found the Open Software Foundation.

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2. Mail Entry Form to: Communication Networks, "See The Communications World" Contest, P.O. Box 9171, Framingham, MA 01701-9171. Be sure to affix postage.

3. All entries must be received by midnight, November 15, 1988. Contest drawing will be held November 30, 1988. Communication Networks is not responsible for entries delayed, late, mutilated or lost in the mail. Odds of winning depend on the number of entries received. ***Only one entry per person.*** Entries become the property of Communication Networks.

4. One (1) First Prize, one (1) Second Prize and one (1) Third Prize will be awarded. Winners will be selected at random. All prizes will be awarded, and winners will be notified by phone. Only one prize per individual. Prizes are non-transferable and no substitutions or cash equivalents will be allowed. Winners will be required to provide consent for use of their name and picture in advertising and publicity.

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Another shoe drops

IBM, which transferred its domestic copier service, sales and lease agreements to **Eastman Kodak Co.** effective this past July, last week announced that Kodak will buy 16 countries' worth of IBM foreign copier contracts as well. The agreement covers Austria, Belgium, Denmark, Finland, France, West Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland and the UK, as well as non-European entries Argentina, Australia and Canada.

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Conductus reaps HP investment

Year-old Palo Alto, Calif.-based superconductivity company **Conductus, Inc.** nearly doubled its capital last week, courtesy of a multimillion dollar equity investment by neighbor **Hewlett-Packard Co.** The investment nets HP 15% of the venture-backed start-up and a seat on its board of directors, not to mention a leg up in superconductivity research.

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Wanna buy a Mountain?

Campbell, Calif.-based **Mountain Computer, Inc.** announced earlier this month that it will be acquired by the Tokyo-based firm **Nakamichi Corp.** for $45 million in cash. Both companies are suppliers of tape drive equipment. The current Mountain management will remain in place when the deal closes. In addition, both the headquarters in Campbell and a facility in Scotts Valley, Calif., will be maintained, according to a Mountain spokesman.

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From Software AG to Cortex

Former **Software AG of North America, Inc.** President and Chief Executive Officer Stuart J. Miller was named president and chief executive officer of **Cortex Corp.**, a Waltham, Mass.-based developer of computer-aided software engineering products for the Digital Equipment Corp. VAX. Cortex founder, President and CEO Craig Hill retained the title of chairman.

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Home improvements

Compaq Computer Corp. completed a $150 million financing deal to pay for a major expansion of its Houston headquarters and manufacturing facilities. Underwriting the move is Prudential Capital Corp., a merchant banking subsidiary of Prudential Insurance Company of America. Prudential Capital purchased $75 million in 10-year mortgage notes from Compaq and agreed to purchase an additional $75 million in notes within the next two years.

Honeywell, Unisys at war

BY NELL MARGOLIS
CW STAFF

What began as a defense-related purchase threatened to erupt into courtroom war during the past several weeks as Honeywell, Inc. and Unisys Corp. fired off lawsuits against each other over Unisys' 1986 sale of Sperry's defense avionics division to Honeywell for $1.03 billion.

The charges basically boil down to this: Honeywell contends that Unisys sold it a billion dollar lemon. Unisys contends that it did not — and that Honeywell had every chance to poke and prod the unit before buying.

In late September, Unisys went to the New York Supreme Court for a declaratory judgment — a judicial statement of the facts — fixing who owed what to whom under the 2-year-old sales contract, a Unisys spokesman said. In addition, Unisys sued Honeywell for about $565,000 allegedly due under the agreement.

Last week, Honeywell sent off its return shot: a separate action, brought in U.S. District Court in Minnesota, charging Unisys with failure to disclose material, financial and other information at the time of the sale and seeking damages which were estimated at about $351 million.

Originally seen as a corporate coup, the purchase of what is now the Honeywell Defense Avionics Systems Division has proved more burden than benefit for Honeywell.

The company recently issued its second consecutive warning of falling quarterly earnings and predicted declining earnings for the year, all based on what a Honeywell spokesman called "inadequate contract cost-recognition practices and asset write-offs" at the avionics division that "were deeper and more widespread than originally thought."

Unisys contends the problems are not because of any failure to disclose on its part.

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Carlos Cadalzo is president of Integrated Systems Technology, Inc., a 10-year old CICS consulting company that recently began marketing PC-based development tools for on-line systems.

The company created the Quick Screen 3270, a development tool that helps analysts design screens for CICS and IMS/DC systems — without requiring a programming background. The next step was to determine the best way to reach the buying market for this new tool. And for Carlos, the first option that came to mind was *Computerworld.*

"I wasn't sure exactly how to do it, but I knew that Computerworld *reaches the people we want to talk to. So when I met with a* Computerworld *sales representative and described the situation, he suggested* Computerworld *Response Card decks.*

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"At first we were concerned that we didn't have the resources to do a full market study, but the cards told us everything we needed to know. We got both quantity and quality in terms of responses. At least 20 cards came back from Fortune 500 companies alone.

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— Carlos Cadalzo
President
Integrated Systems Technology, Inc.

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Uncle Sam wants you in MIS

Federal work is livelier than some critics profess and may get better

BY DAVID A. LUDLUM
CW STAFF

Not that you should expect the glory portrayed in recruitment commercials for the armed services, but a growing awareness of some of the hardships faced by federal government employees could lead to better days for Uncle Sam's MIS workforce.

Working for the federal government has its drawbacks, among them a lack of competitive compensation, Byzantine hiring procedures, obstacles to career advancement and an image of bureaucratic rigidity and stodginess.

The government pays a technical professional in the mid-career G-12 classification an annual salary of $38,866, about $7,000 less than the state of New York would pay and $18,000 less than would a local company, according to the magazine *Government Executive.*

Metropolitan mismatch

"The pay is very competitive in Little Rock or Des Moines, but in Washington or Los Angeles or New York City, these salaries are really not competitive," says Robert Head, an independent consultant in Stafford, Va., and a former information resources management official at the Department of Agriculture.

Adding to the woes, many senior managers are "time servers" awaiting retirement, who cannot be terminated unless they do something horrendous, Head says. "The result is that you have people in the higher grades who basically have lifetime tenure, and they are blocking advancement for younger people coming up through the ranks," he says.

Finally, "fed-bashing" has hurt the morale of government workers, particularly as the Carter and Reagan administrations have heavily criticized the bureaucracy, Head says.

These factors inhibit the government's ability to recruit professionals in areas where talent is scarce, such as information systems, according to recent studies, including one by the American Society for Public Administration. They also lead to high turnover in the ranks of senior managers, say recent reports by the General Accounting Office.

But experts say things may not be as bleak as they appear and that they may get better.

First, although pay is modest at the entry level and lacks the high-end potential of the private sector, it is much more competitive with private industry in the mid-career range, observers agree.

Furthermore, the government often contracts with systems integrators to carry out major development projects, and by taking on management of the contracts, workers often can gain responsibilities more quickly than they would in the corporate world, says Francis A. McDonough, deputy commissioner of the General Services Administration's Information Resources Management Service.

> "IF YOUNG people would come into the government at the lowest salaries and stay five years, they probably would be making more and doing more interesting work than their counterparts who take jobs with the private sector here in Washington."
>
> FRANCIS A. McDONOUGH
> GENERAL SERVICES ADMINISTRATION

Dollar days

"If young people would come into the government at the lowest salaries and stay five years, they probably would be making more and doing more interesting work than their counterparts who take jobs with the private sector here in Washington," McDonough says. The federal government also provides extensive training to younger workers, according to McDonough and others.

To address the lack of competitive salaries, the government's Office of Personnel Management (OPM) is moving to allow agencies to negotiate starting pay for experienced workers with scarce skills, in some cases offering as much as 20% more than a candidate's current pay (see story page 84). The OPM is also enabling agencies to speed the hiring process by letting them circumvent bureaucratic procedures.

While entrenched senior managers may block career advancement to top MIS jobs, workers can count on climbing steadily through the lower rungs, says Carol L. Covin, a former programmer for the U.S. Navy and author of *The Computer Professional's Job Guide for the Washington, D.C., Area.* "It's not entirely tied to seniority, but it's heavily tied to seniority. You can be pretty well assured that up to a point you're going to be able to advance in your career."

Looking ahead, not back

Covin also argues that the perception of government work as mundane or archaic is misleading. The work can include forward-looking projects such as leading the effort to establish Unix as a standard operating system, she says. Furthermore, government employees often enjoy a sense of mission tied to their agency's responsibilities.

"The people I talk to in the government are doing exciting things," Covin says. "They're trying to do something as citizens as well as professionals. The only thing that bothers them is the perception that they are not up to date. The perception is that they don't know anything. It's not true."

The public perception of government workers can only improve with the change of presidential administrations in January, Head says. "The new administration will have a more positive attitude toward public service than the past administration. I think the top management of the government, regardless of who wins the election, is going to be more supportive of the civil service than in the past."

Ludlum is a *Computerworld* senior writer.

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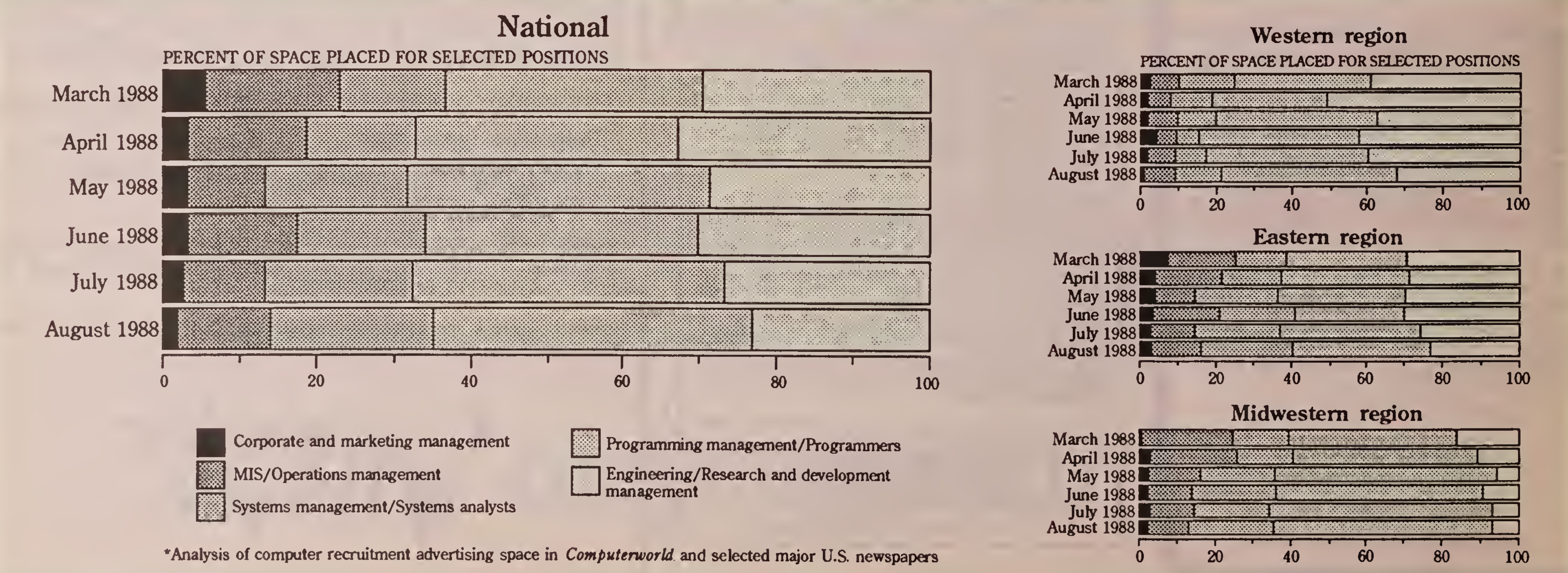

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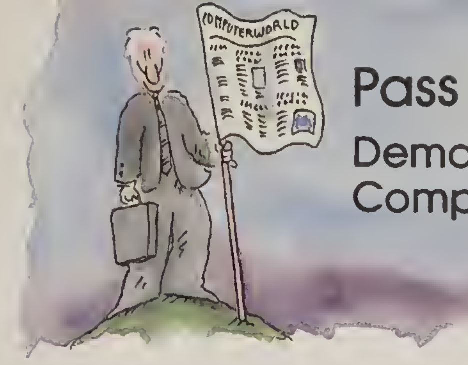

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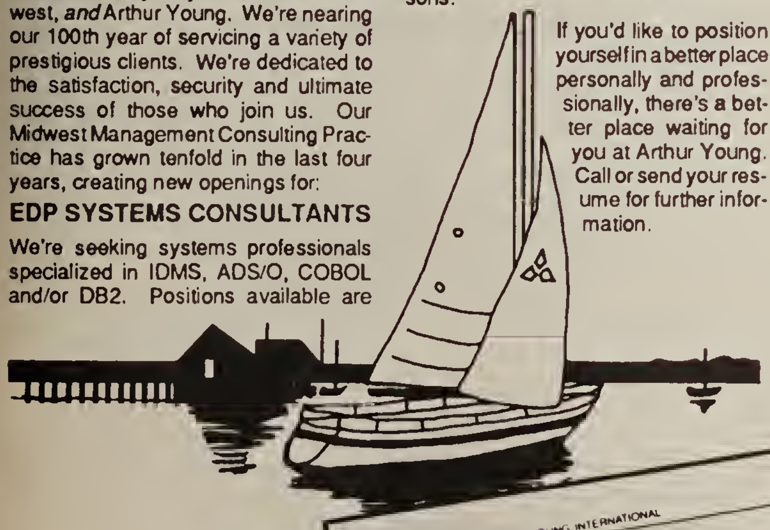

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3 columns	4-1/16″	3″
4 columns	5-9/16″	4″
5 columns	6-15/16″	5″
6 columns	8-3/8″	6″
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Oppty for RPG programmers with 1-3 yrs exp with IBM Sys/36 or 38, AS400 a plus but not required. This is a ground floor oppty to become part of a rapidly growing Charlotte firm! Salary to $30,000.

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Systems Development Programmer Analyst

Requires at least 3 years' application programming background including 1 year systems design. In addition, a Technical Associate's degree or the equivalent plus familiarity with basic financial systems processing is needed. Experience in COBOL programming in a DOS environment using ICCF and CMS systems development tools is also required.

Senior Programmer Analyst

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MARKETPLACE

The AS/400 connectivity factor

Linkage with new mid-range is driving force of used IBM printer prices

BY BENJAMIN T. GALE
IDC FINANCIAL SERVICES CORP.

On June 21, when the IBM Application System/400 was announced, IBM did not unveil any System/36- and 38-attachable printers. As a result, AS/400 customers have only two options for increasing printing capacity: buy a new IBM existing System/36 and 38 printer offering or purchase a used IBM System/36 and 38 printer on the secondary market.

Of the two choices available to end users, the second is by far the most popular. One System/36 and 38 printer family that has suffered noted declines in value on the used market since the announcement of the AS/400 is the 3262. The AS/400 debut has caused used values of the 3262 Models BO1 and CO1 to drop significantly because they are not attachable to the new mid-range system. According to IDC Financial Services Corp., used values for this printer family dropped 37% on the retail market between June and September.

As shipments of the AS/400 are ramped up, the supply of Models BO1 and CO1 will continue to increase on the secondary market.

Demand up for 5262

For end users who are looking for a 650 line/min printer that is attachable to the AS/400, the only choice within the IBM printer line is the 5262. This model replaced the 3262 in late 1984. Recent IDC Financial Services research shows a tightening in the 5262's used market value caused by an increase in demand for its attachability to the AS/400.

The used market for the IBM 4214-2 has been declining gradually during the last four months. Current research indicates that the fair market value of the 4214-2 has dropped 8% since June.

Secondary market prices for the 4214-2 have fallen as a consequence of end-user migration to the newer IBM 4224-1XX model printers. Users have been displacing the 4214 for 4224 units because of intelligent printer data stream (IPDS) capabilities offered on the 4224 machines. IPDS is an advanced function host-to-printer data stream that allows for an unlimited mix of high-quality text, raster images, vector graphics and bar codes. Additionally, IPDS provides commands for management of fonts and overlays.

IBM System/36, 38 printers
Current fair market value

Model	Date shipped	IBM list price	Retail percent of list price
3262-BO1	First-quarter 1977	$15,790	19%
-C01	July '83	$15,790	19%
4214-2	Fourth-quarter '84	$4,600	54%
5224-1	Third-quarter '82	$6,030	52%
5224-2	Third-quarter '82	$6,860	67%
5225-1	First-quarter '80	$9,660	44%
5225-2	First-quarter '80	$11,160	56%
5225-3	First-quarter '80	$12,400	55%
5225-4	First-quarter '80	$14,200	61%

SOURCE: IDC FINANCIAL SERVICES CORP.
CW CHART

Initially, the migration to the 4224 family was slow, although during the last several months, more end users have been migrating to the newer 4224-1 machines. Because of the high user acceptance for the 4224-1s, these models have not yet begun to trade actively on the used market.

The 5224 line printer family's used values have held strong on the secondary market during the past 24 months. Currently, demand for Models 1 and 2 is good. However, the Model 2 is realizing a slightly stronger demand than is the other. This is because users prefer the faster speed of the Model 2 at 240 line/min compared with 140 line/min for the Model 1.

One of the main reasons behind this year's strong demand for the 5224s is their attachability to the AS/400. Since January, fair market values have fluctuated — at best 8% for both Models 1 and 2.

5225s hang tight

As with the 5224s, the IBM 5225 line matrix printer's used values also continue to hold steady. According to secondary market contacts, activity for the 5225 has remained active even though these printers were first shipped in early 1980.

Dealers report that both the 5224 and 5225 are inexpensive, reliable printers, and therefore, they have realized long, healthy life cycles.

Within the 5225 line, the demand is greatest for the Model 4. Its fair market value on the retail used market is 61% of its list price of $14,200.

In addition, the Model 4 was the only 5225 printer to be affected by the IBM July 28 price increase, since it is still actively marketed by the company, while Models 1, 2 and 3 have been withdrawn.

For more information, contact IDC Financial Services Corp.'s Terri LeBlanc at 508-872-8200.

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The BoCoEx index on used computers

Closing prices report for the week ending Oct. 14, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$625	$900	$400
XT Model 086	$1,075	$1,250	$900
XT Model 089	$1,300	$1,575	$1,050
AT Model 099	$2,050	$2,400	$1,700
AT Model 239	$2,600	$2,900	$2,300
AT Model 339	$2,900	$3,650	$2,425
PS/2 Model 30	$1,575	$1,700	$1,300
PS/2 Model 50	$2,350	$2,600	$1,900
Compaq Portable I	$775	$975	$650
Portable II	$1,850	$2,000	$1,650
Portable III	$2,850	$3,550	$2,575
Portable 286	$2,075	$2,400	$1,675
Plus	$1,100	$1,250	$800
Deskpro 20-MHz	$1,025	$1,450	$975
Deskpro 286	$2,575	$3,150	$2,000
Deskpro 386	$4,500	$5,100	$4,100
Apple Macintosh 512	$725	$900	$550
512E	$800	$1,025	$600
Plus	$1,100	$1,325	$950
Plus 20-MHz	$1,425	$1,450	$1,300
SE	$1,950	$1,950	$1,700
SE 20-MHz	$2,450	$2,675	$2,000
II	$5,250	$5,250	$4,500
Leading Edge Model D	$575	$650	$450
NEC Multispeed EL	$900	$950	$650

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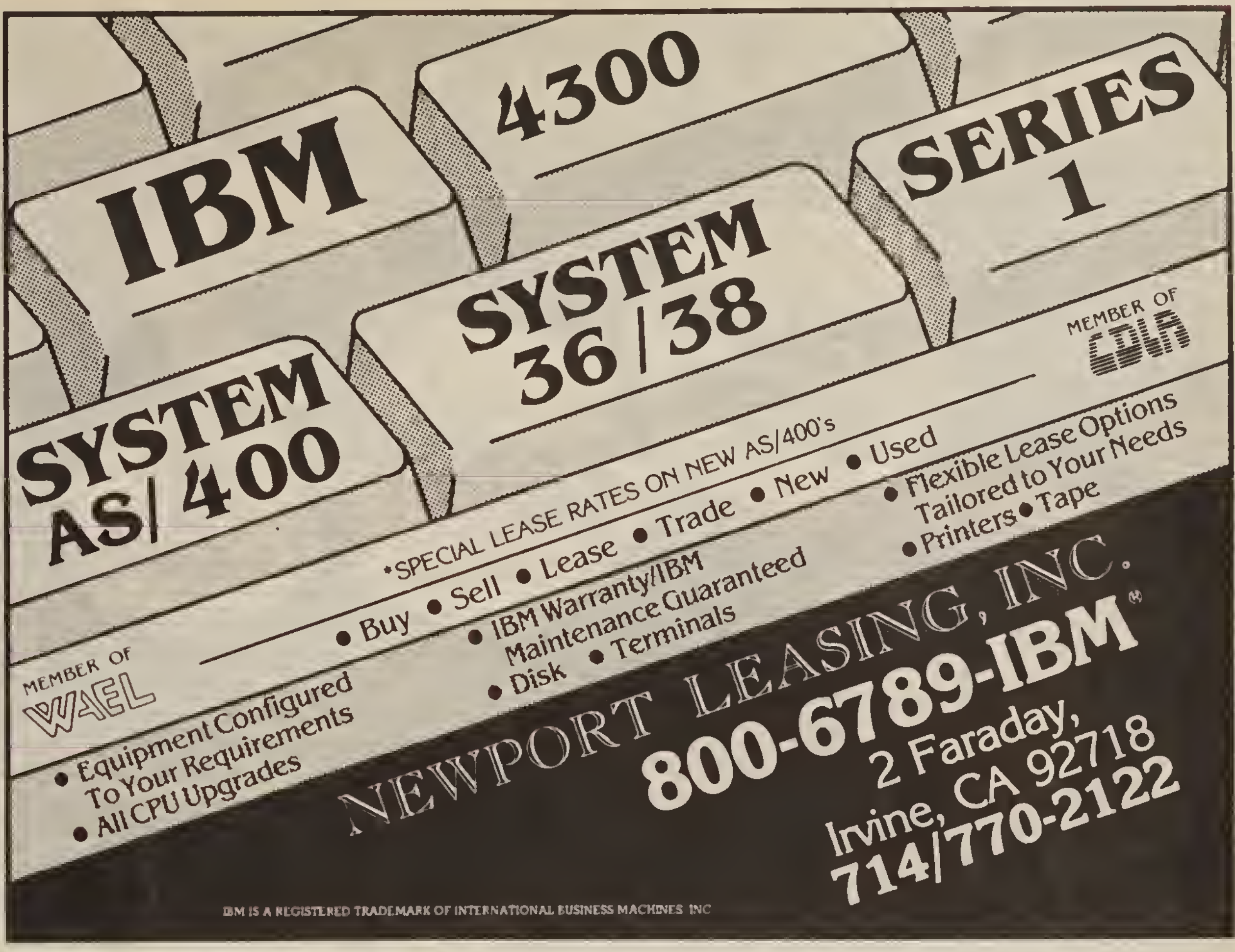

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How much should you spend?

You may be shelling out more than you think on training; is it enough?

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Whatever a data processing organization spends on training, top managers may well complain that it is too much and use it as a slashing ground to relieve budget pressure.

But this obscures the real question: How much should a company spend on its technical training?

Historically, a company providing the technical and career training to maintain acceptable turnover and productive support has spent 3.5% to 4.5% of its total DP budget on training.

Now, if you grabbed a calculator and figured out how much this percentage translates for your company, maybe you'd say, "No way." But let's take a look at what is actually going on in the technical training world.

You're kidding me

Most companies do not have the faintest idea how much they are really spending. Certainly, the amount is far more than what is documented in the education budget. For example, what about all those "free" technical briefings run by hardware vendors? The professional society meetings and conferences buried in the DP manager's budget under "industry meetings"? The courses taught by someone on the DP staff in the department conference room?

The price of admission to a technical training session for a programmer making $30,000 per year ranges from $270 per day for an in-house course to $500 or more per day for a commercial course requiring travel to another city. Of course, that cost does not include the expense of lost productivity while the individual attends class.

The cost is calculated by adding 25% for benefits — and probably more for larger companies — to the base salary and dividing the sum by the number of productive work days in a year, typically 220. To that $170 per day must be added to the cost of the course; a conservative figure is $100 per day in-house or $150 to $250 plus travel and lodging outside. The result is what a company actually spends for an individual to attend a course.

How much career training and technical training should a company provide for its technical staff? A company with a large recruiting program and new and innovative development projects should provide application people with 10 days per year in formal training and systems programmers with 13 days. A smaller company with minimum turnover, no training of raw recruits and a small number of development projects should provide about seven days per year for application people and 10 days for systems programmers.

> MOST COMPANIES do not have the faintest idea how much they are really spending. Certainly, the amount is far more than what is documented in the education budget.

Now grab those calculators again and see what your company is really spending on training. Remember, all your programmers do not earn $30,000 per year. Sending a senior analyst making $40,000 per year to class costs from $325 to $650 for each day in the classroom. Now those figures of 3.5% to 4.5% of the total DP budget sound more realistic and are probably closer to the truth.

As frightening as those amounts may appear, they are nothing if your company expects growth in DP staff in the next few years or plans to use new productivity technologies such as computer-aided software engineering, application engineering, fourth-generation languages, workstations, computer-aided design and manufacturing or artificial intelligence.

Zap!!

If so, stand by for a jolt in the pocketbook. These new technologies will require you to spend more on training in order to get in the game. The problem is compounded by the inertia of older systems. Until you reengineer them with the new tools, you have to continue training to support them too.

The base training budget does not even include business training for the DP professional — a seriously neglected need — or management training for technical managers, another requirement that is often missing.

It also does not include the cost of retraining staff members to be programmers when one area is cut back in favor of another. There is also the question of accommodating the increasing demand by end users for technology training as they do more and more development on their own.

Companies are going to have to face up to the real costs of training. More important, technical training departments and the developers of productivity tools must come up with better and more economical training delivery techniques to get those costs down. The bottom line is that everybody is going to have to contribute something.

Sebrell is a vice-president at Data Base Management, Inc., a subsidiary of American Management Systems, Inc., in Manchester, Conn.

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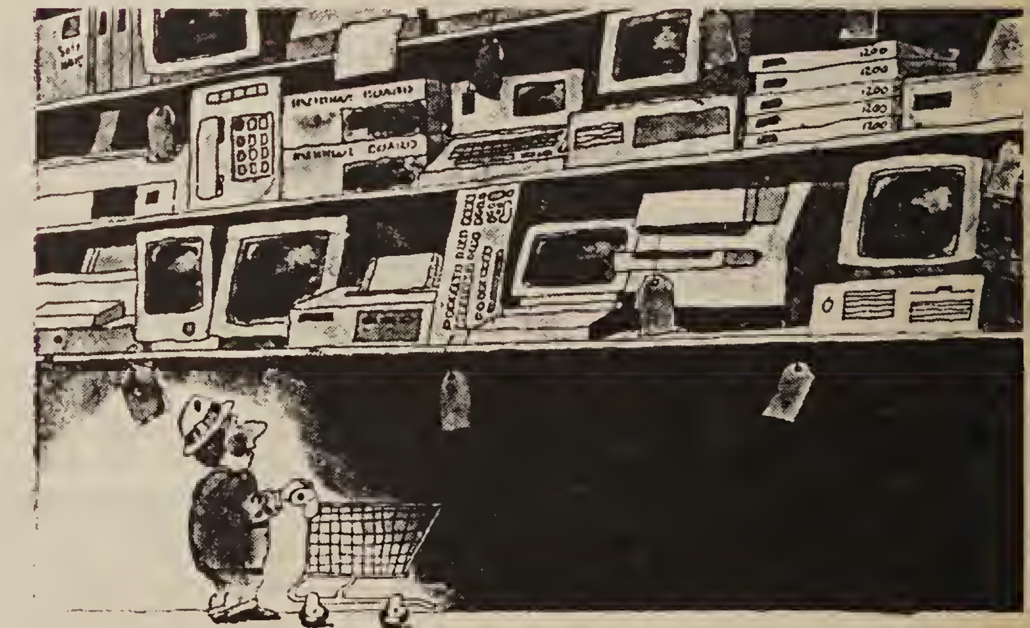

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Dec. 19	IBM-Compatible PCs/PS2 Market Products/Monitors	Dec. 2

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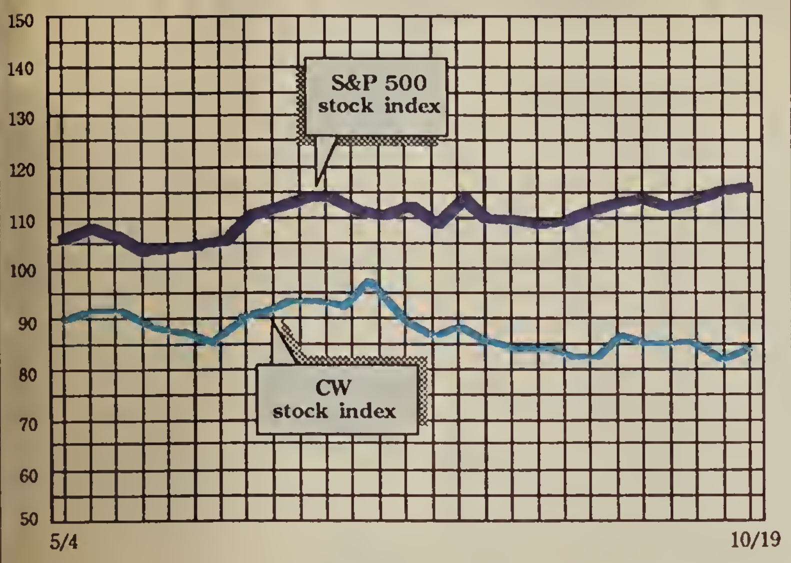

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Computer Systems	93.6	**93.1**
Software & DP Services	100.5	**102.5**
Semiconductors	56.5	**57.3**
Peripherals & Subsystems	77.8	**77.9**
Leasing Companies	116.3	**115.3**
Composite Index	83.9	**84.4**
S&P 500 Index	115.3	**116.5**

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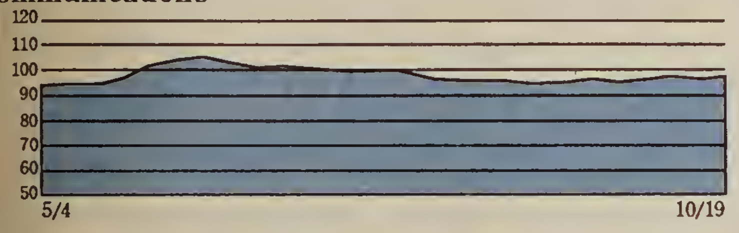

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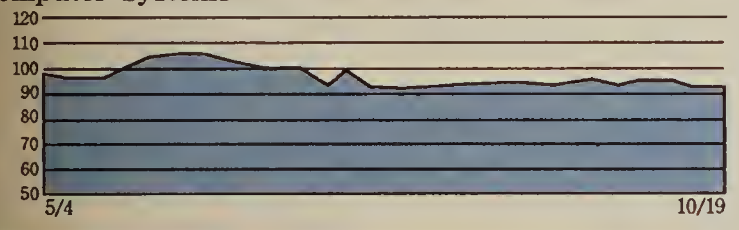

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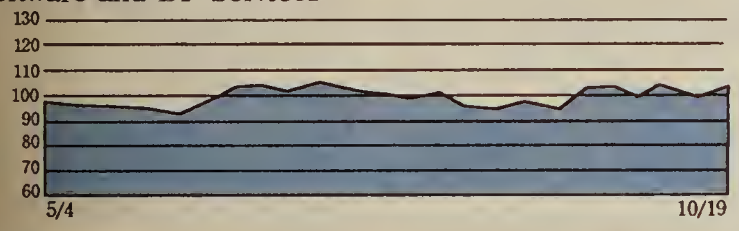

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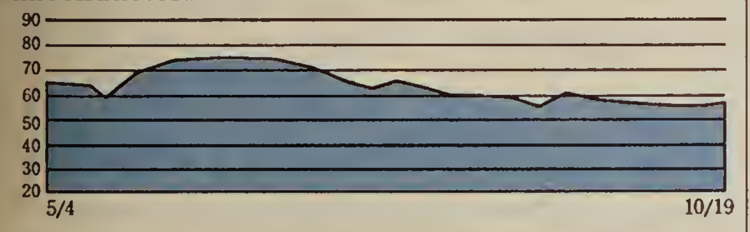

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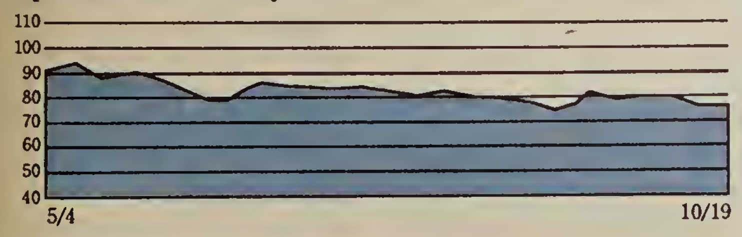

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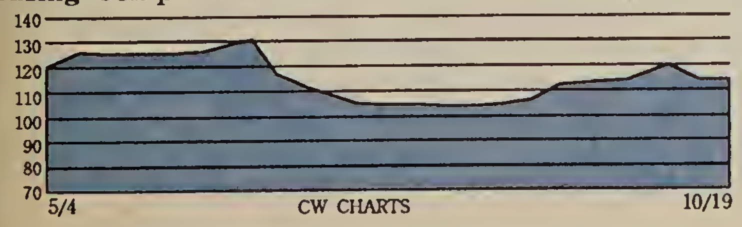

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCT. 19, 1988

Communications and Network Services

EXCH		PRICE 52-WEEK RANGE (1)		PRICE CLOSE OCT. 19 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	96	74	93.75	0.0	0.0
Q	ANDREW CORP	19	11	15.5	-0.8	-4.6
Q	ARTEL COMM CORP	3	1	1.75	0.0	0.0
N	AT&T	31	24	26.875	0.4	1.4
Q	AVANT GARDE COMP INC	4	1	0.75	0.0	0.0
Q	AVANTEK INC	11	5	5.5	-0.3	-4.3
N	AYDIN CORP	26	16	21.25	-0.4	-1.7
N	BELL ATLANTIC CORP	77	61	72	-0.1	-0.2
N	BELLSOUTH CORP	44	32	41.125	0.4	0.9
Q	COMPRESSION LABS INC	5	2	2.875	-0.1	-4.2
O	COMPUTER NETWORK TECH	3	1	1.313	0.0	0.0
O	CONTEL CORP	38	25	37.625	0.4	1.0
Q	DATA SWITCH CORP	10	4	6.375	-0.3	-3.8
Q	DIGITAL COMM ASSOC	38	20	22.125	-0.4	-1.7
Q	DYNATECH CORP	25	14	20.375	0.1	0.6
Q	FIBRONIX INTERNATIONAL INC	5	2	3.5	0.1	3.7
Q	GANDALF TECHNOLOGIES	8	5	5.625	-0.3	-4.3
Q	GENERAL DATACOMM INDS	5	3	3.875	0.0	0.0
N	GTE CORP	44	31	42.625	0.4	0.9
Q	INFOTRON SYS CORP	14	5	12	0.8	6.7
N	ITT CORP	55	42	52.125	1.8	3.5
N	M A COM INC	11	7	10.125	0.3	2.5
Q	MCI COMMUNICATIONS CORP	23	7	22.625	3.0	15.3
Q	NETWORK EQUIPMENT TECH INC	23	12	17.5	2.0	12.9
Q	NETWORK SYS CORP	12	7	9.875	0.4	3.9
N	NORTHERN TELECOM LTD	20	14	18.5	0.0	0.0
Q	NOVELL INC	31	12	29.25	0.5	1.7
N	NYNEX CORP	74	58	66.125	0.3	0.4
N	PACIFIC TELESIS GROUP	31	25	30.625	0.5	1.7
N	PARADYNE CORP	6	4	5.875	0.1	2.2
A	PENRIL CORP	5	1	4.5	0.1	2.9
N	PLESSEY PLC	35	23	28.938	1.2	4.3
N	SCIENTIFIC ATLANTA INC	16	8	12.125	0.5	4.3
N	SOUTHWESTERN BELL CORP	41	31	40.625	0.5	1.2
Q	3 COM CORP	24	12	19.25	1.0	5.5
N	U S WEST INC	59	43	56.625	-1.5	-2.6

Computer Systems

EXCH		PRICE 52-WEEK RANGE (1)		PRICE CLOSE OCT. 19 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	9	4	3.875	-0.2	-4.6
Q	ALPHA MICROSYSTEMS	8	3	6.75	0.1	1.9
Q	ALTOS COMPUTER SYS	13	7	7.625	-0.4	-4.7
A	AMDAHL CORP	28	10	20.75	1.6	8.5
Q	APOLLO COMPUTER INC	17	8	8.25	0.0	0.0
Q	APPLE COMPUTER INC	48	28	40	1.3	3.2
N	BOLT BERANEK & NEWMAN	19	12	14	0.3	1.8
Q	BRITTON LEE INC	3	1	2.375	0.1	5.6
N	COMPAQ COMPUTER CORP	66	34	55.25	3.3	6.3
Q	COMPUTER AUTOMATION INC	14	4	4.75	0.1	2.7
A	COMPUTER CONSOLES INC	9	2	8.75	0.5	6.1
Q	CONCURRENT COMP CORP	20	5	4.5	-15.3	-77.3
N	CONTROL DATA CORP DEL	31	18	19.875	-1.6	-7.6
Q	CONVERGENT TECH	7	3	6.375	-0.1	-1.0
Q	CONVEX COMPUTER CORP	11	6	9.125	0.5	5.8
N	CRAY RESH INC	89	47	70.75	2.9	4.2
Q	DAISY SYS CORP	12	5	7.625	-0.1	-1.6
N	DATA GEN CORP	28	16	18.75	-0.4	-2.0
N	DATAPOINT CORP	6	3	4.75	-0.1	-2.6
Q	DELL COMPUTER CORP	12	8	11.125	1.0	9.9
N	DIGITAL EQUIP CORP	150	88	89.625	-0.9	-1.0
N	FLOATING POINT SYS INC	6	3	2.75	0.1	4.8
N	GOULD INC	23	8	22.875	-0.3	-1.1
N	HARRIS CORP DEL	33	22	28.375	1.8	6.6
N	HEWLETT PACKARD CO	66	36	49	-0.3	-0.5
N	HONEYWELL INC	77	49	62	-2.6	-4.1
N	IBM	130	104	122.375	4.9	4.1
Q	INFORMATION INTL INC	16	9	13.75	-0.3	-1.8
Q	IPL SYS INC	4	1	3.875	0.5	14.8
N	MAI BASIC FOUR INC	21	9	14.125	-1.3	-8.1
N	MATSUSHITA ELEC INDL LTD	230	122	183.125	9.1	5.2
Q	MEGADATA CORP	4	2	1.625	-0.1	-7.1
Q	MENTOR GRAPHICS CORP	37	14	29.25	1.9	6.8
N	NBI INC	7	2	2.125	0.0	0.0
N	NCR CORP	70	50	55.125	-2.9	-5.0
N	PRIME COMPUTER INC	19	12	13	-0.6	-4.6
Q	PYRAMID TECHNOLOGY	16	5	14.25	0.9	6.5
Q	SILICON GRAPHICS CORP	25	11	16	0.0	0.0
Q	STRATUS COMPUTER	32	15	24.5	1.8	7.7
Q	SUN MICROSYSTEM INC	41	22	30.625	2.4	8.4
Q	SYMBOLICS INC	2	1	0.938	-0.1	-6.2
Q	SEQUENT COMPUTER SYS INC	19	9	17.25	0.1	0.7
N	TANDEM COMPUTERS INC	30	12	14.5	0.8	5.5
N	TANDY CORP	49	28	41.875	0.6	1.5
N	ULTIMATE CORP	25	9	10	-0.1	-1.2
N	UNISYS CORP	39	24	28.125	-3.0	-9.6
A	WANG LABS INC	17	9	8.875	-0.4	-4.1

Software & DP Services

EXCH		PRICE 52-WEEK RANGE (1)		PRICE CLOSE OCT. 19 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ADVANCED COMP TECH	5	1	1.813	0.0	0.0
Q	AMERICAN MGMT SYS INC	19	9	15.125	-0.3	-1.6
Q	AMERICAN SOFTWARE INC	16	6	15.375	0.3	1.7
N	ANACOMP INC	12	4	9.25	0.1	1.4
Q	ANALYSTS INTL CORP	10	4	10	0.9	9.6
Q	ASHTON TATE	31	13	25	2.3	9.9
Q	ASK COMPUTER SYS INC	16	6	12.875	0.5	4.0
Q	AUTODESK INC	31	12	27.25	1.0	3.8
N	AUTO DATA PROCESSING	47	33	38.125	0.9	2.3
Q	BOOLE & BABBAGE INC	10	5	9.25	-0.3	-2.6
N	BUSINESSLAND INC	14	7	13.25	0.3	1.9
N	COMPUTER ASSOC INTL INC	33	15	30.625	1.9	6.5
Q	COMPUTER HORIZONS CORP	12	7	8.625	0.5	6.2
N	COMPUTER SCIENCES CORP	56	38	48.75	0.1	0.3
Q	CORPORATE SOFTWARE	15	5	9.75	0.0	0.0
N	COMPUTER TASK GROUP INC	17	9	16.25	-0.3	-1.5
Q	COGNOS INC.	9	4	6.5	-0.3	-3.7
Q	COMSHARE INC	25	13	18	-2.0	-10.0
N	CULLINET SOFTWARE INC	9	4	6.25	0.6	11.1
Q	DUQUESNE SYS INC	22	10	19.25	1.3	6.9
N	GENERAL MTRS (CLS E)	45	30	41.75	0.3	0.6
Q	HOGAN SYS INC	8	3	5.125	-0.4	-6.8
Q	INFORMIX CORP	26	7	8.625	-0.1	-1.4
Q	INTELLICORP INC	5	2	3.375	-0.1	-3.6
Q	KEANE INC	16	6	15	2.0	15.4
Q	LOTUS DEV CORP	40	15	16.75	1.5	9.8
Q	MANAGEMENT SCI AMER	14	6	7.5	0.4	5.3
Q	MICRO PRO INTL CORP	5	2	2.875	0.1	2.2
Q	MICROSOFT CORP	71	37	53.25	2.6	5.2
Q	MORINO ASSOCIATES INC	20	7	15	0.8	5.3
Q	NATIONAL DATA CORP	32	20	23.5	-0.5	-2.1
Q	ON LINE SOFTWARE INTL INC	14	4	6	0.6	11.6
Q	ORACLE SYS CORP	22	8	18	0.0	0.0
N	PANSOPHIC SYS INC	20	11	13.75	0.8	5.8
Q	PHOENIX TECHNOLOGIES INC	18	14	14.5	0.0	0.0
Q	POLICY MGMT SYS CORP	26	15	25.25	1.8	7.4
Q	PROGRAMMING & SYS INC	15	7	14	0.5	3.7
Q	RABBIT SOFTWARE INC	4	2	2.875	-0.3	-8.0
Q	RELATIONAL TECHNOLOGY INC	21	13	14	-0.1	-0.9
Q	REYNOLDS & REYNOLDS CO	24	14	22	0.3	1.1
Q	SEI CORP	22	10	16.375	-2.4	-12.7
Q	SHARED MED SYS CORP	27	14	16.125	0.3	1.6
Q	SAGE SOFTWARE INC.	9	5	7.125	0.0	0.0
Q	SOFTWARE PUBG CORP	27	5	25.375	1.6	6.8
A	STERLING SOFTWARE INC	9	6	7.625	0.0	0.0
Q	SUNGARD DATA SYS INC	20	10	16.25	0.4	2.4
Q	SYSTEMATICS INC	34	19	28.75	0.5	1.8
N	SYS. SOFT INC.	24	7	22.5	-0.5	-2.2
N	VM SOFTWARE INC	18	7	15.00	.75	5.3

Semiconductors

EXCH		PRICE 52-WEEK RANGE (1)		PRICE CLOSE OCT. 19 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	17	8	9.375	-0.5	-5.1
N	ANALOG DEVICES INC	16	8	11.375	0.5	4.6
Q	ANALOGIC CORP	9	5	7.25	0.4	5.5
Q	CHIPS & TECHNOLOGIES INC	21	8	11.625	-0.1	-1.1
Q	INTEL CORP	37	18	26.375	1.6	6.6
Q	LSI LOGIC CORP	14	7	9.625	0.8	8.5
Q	MICRON TECHNOLOGY INC	26	5	20.75	1.1	5.7
N	MOTOROLA INC	60	35	39.5	-0.3	-0.6
N	NATL SEMICONDUCTOR	16	8	9.5	-0.4	-3.8
N	TEXAS INSTRS INC	60	36	41.125	1.6	4.1
A	WESTERN DIGITAL CORP	20	11	11.75	-1.0	-7.8

Peripherals

EXCH		PRICE 52-WEEK RANGE (1)		PRICE CLOSE OCT. 19 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLOY COMP.	8	2	3.125	0.5	19.0
N	AM INTL INC	6	3	5.375	-0.1	-2.3
Q	AST RESH INC	17	6	8.125	-0.5	-5.8
Q	AUTO TROL TECH CORP	6	3	5.125	-0.1	-2.4
Q	BANCTEC INC	10	5	9.625	1.3	14.9
Q	CIPHER DATA PRODS INC	10	4	9.25	0.8	8.8
A	COGNITRONICS CORP	4	2	2.875	0.1	4.5
Q	CONNOR PERIPHERALS	10	7	7.625	-0.3	-3.2
A	DATAPRODUCTS CORP	13	7	13.25	2.6	24.7
A	DATARAM CORP	9	5	8.125	-0.4	-4.4
N	EASTMAN KODAK CO	65	39	48.5	1.5	3.2
Q	E M C CORP MASS	19	4	3.875	-0.3	-6.1
Q	EMULEX CORP	11	4	10.375	0.3	2.5
Q	EVANS & SUTHERLAND	25	14	13.75	0.3	1.9
Q	ICOT CORP	6	3	2.875	-0.3	-8.0
Q	INTERLEAF INC	21	7	8.125	0.9	12.1
Q	IOMEGA CORP	5	1	3.063	-0.1	-3.9
Q	LEE DATA CORP	4	3	2.875	0.0	0.0
Q	MASSTOR SYS CORP	3	1	2.438	0.3	11.4
Q	MAXTOR CORP	16	6	6.5	-0.4	-5.5
Q	MICROPOLIS CORP	30	8	8.125	0.1	1.6
Q	MINISCRIBE CORP	14	5	7.625	-0.5	-6.2
N	MINNESOTA MNG & MFG CO	68	45	62.625	0.5	0.8
A	MSI DATA CORP	24	8	22.5	-0.5	-2.2
Q	PERSONAL COMPUTER PRODUCTS INC.	7	4	5.125	0.0	0.0
Q	PRIAM CORP	3	1	1.5	-0.1	-4.0
Q	PRINTRONIX INC	11	7	9.625	0.1	1.3
N	QMS INC	19	7	7	-0.5	-6.7
Q	QUANTUM CORP	14	8	12.25	-0.4	-3.0
N	RECOGNITION EQUIP INC	11	6	6	0.3	4.3
Q	REXON INC	9	4	6.625	0.5	8.2
Q	SEAGATE TECHNOLOGY	23	7	7.375	-0.5	-6.3
N	STORAGE TECH CORP	4	1	1.75	-0.1	-6.7
Q	TANDON CORP	4	1	1.563	-0.1	-7.4
A	TEC INC	6	3	3	-0.1	-4.0
N	TEKTRONIX INC	35	20	21	0.6	3.1
Q	TELEVIDEO SYS INC	2	1	0.625	-0.1	-9.2
N	XEROX CORP	80	50	57.625	-0.5	-0.9

Leasing Companies

EXCH		PRICE 52-WEEK RANGE (1)		PRICE CLOSE OCT. 19 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	AMPLICON INC	17	7	16.5	0.3	1.5
N	CAPITAL ASSOCIATES INTERNATIONAL INC	7	4	6.75	0.0	0.0
N	COMDISCO INC	25	12	21.125	0.6	3.0
Q	CONTINENTAL INFO SYS	9	4	4	-0.1	-3.0
Q	LDI CORPORATION	15	9	13	0.3	2.0
Q	PHOENIX AMERN INC	5	2	3.25	-0.3	-7.1
Q	SELECTERM INC	6	3	4.875	0.0	0.0

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL

Crash rehash bash

Black Monday anniversary marked by heightened gains

The market at large celebrated the first anniversary of the Crash of '87 by surging to a postcrash high, fueled by falling oil prices, bond-market bounce-back and a continuing fervor for takeovers.

The high-tech sector turned out for the birthday bash, with companies such as Sun Microsystems, Inc., Ashton-Tate Corp., Apple Computer, Inc. and MCI Communications Corp. showing impressive gains.

Buoyed by a stellar September-quarter earnings report, Sun closed Thursday at 32⅞, up 2⅞ points. Similarly, MCI's strong third-quarter results shot its stock up 2½ points to 23½, and Apple picked up 2¾ points to close Thursday at 41½.

Rumors that Ashton-Tate and Digital Equipment Corp. are about to announce a deal that will put Dbase on the VAX propelled Ashton-Tate's stock to 26 Thursday, up 1½ points.

Meanwhile, DEC looked sufficiently debased even without Ashton-Tate: In the wake of an end-of-the-week earnings report that showed profits down 17.3% and revenue up 16%, the firm's stock plunged to 87⅝ from last Thursday's close of 91⅛.

NELL MARGOLIS

Olivetti preps MCA-based system

Breaks ranks with EISA consortium; plans other Comdex debuts

BY WILLIAM BRANDEL
CW STAFF

Ing. C. Olivetti & Co. last week announced that it will introduce a Micro Channel Architecture (MCA)-based microcomputer close to the end of this year, becoming the first member of the MCA-rival Extended Industry Standard Architecture (EISA) consortium to break ranks and introduce a Micro Channel PC.

EISA members NEC Information Systems, Inc., Wyse Technology, Inc. and supporter Acer Technologies Corp. are also said to be planning MCA units that could be launched as soon as Comdex/Fall '88. NEC and Wyse both denied plans for a Comdex announcement but did not rule out possible MCA debuts by year's end.

An NEC spokesman said that company officials are currently in corporate headquarters in Tokyo deciding whether they will drop their EISA support and embrace MCA. A decision is expected early next month. "We are reviewing our options and addressing our product decision for the coming months," he said.

Acer would say only that it is introducing an Intel Corp. 80386-based PC at Comdex. However, a company source said the machine will contain an MCA bus.

American Mitac Corp. and DTK Computer, Inc. have also confirmed that they will introduce MCA machines at Comdex.

The vendors that have acknowledged MCA plans explained that customer demand is now strong enough to justify introducing MCA products.

Noting that 37% of microcomputer sales in Europe last quarter were based on MCA and that its personal computer sales profits dropped 32% during the first half of 1988, Olivetti acknowledged that it would make the move to the Micro Channel. Olivetti was one of the founding members of EISA, which announced support for an alternative to the Micro Channel bus last month.

The introductions are a trial balloon and not an indication that the market is fertile for MCA, according to Bruce Stephen, a micro analyst at International Data Corp., a Framingham, Mass.-based market research firm.

"As of now, the MCA market is cold," Stephen said. "At Comdex, there will be drums and trumpets for the Micro Channel to see if dealers and customers are ready to warm up to IBM or not."

IBM may be throwing a few logs on the fire. Sources said the company has recently been issuing low or no licensing fees on MCA patents to encourage PC-compatible makers to support the MCA bus.

Ax falls

FROM PAGE 1

tures or product synergies, we may do that. And there may be some products where we decide to release ahead of schedule."

Datacom users who were interviewed last week said they were concerned about the future of the DBMS under CA's stewardship. That concern will be a major issue for CA to address in a marketplace that has been railroaded by the success of IBM's DB2.

"If the enhancements stop coming, we will be forced to look for another platform," said Neal Lassila, manager of information systems at Empire of America Relocation, Inc. in Orlando, Fla. Datacom supports about 75% of the firm's operation, Lassila said, and Datacom enhancements to date have kept him from veering to DB2.

Lassila's concern was echoed by James Clark, manager of systems software at the State of Pennsylvania Higher Education Agency in Harrisburg, Pa. Clark said the shop wants to be able to use the DBMS in the future with IBM's MVS/ESA.

'Art, not science'

Wang said the 500 layoffs were concentrated in administrative positions, but an unspecified number of developers were affected as well, including Datacom developers.

"Software development is an art form, not a science," Wang said. "ADR had an overabundance of development people, and they were stepping all over each other."

One terminated employee said 35 people on the 200-member development and support staff for Datacom were let go.

ADR President Dennis Strigl will return to former parent Ameritech after an unspecified transition period. Heading the Information Products Division in his place is Arnold S. Mazur, formerly the leader of CA's operations in Europe.

Competing with DB2 remains CA's biggest challenge for the ADR product line, said DBMS consultant Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

"IBM has put together a well-conceived plan for the 1990s, with APPC linking databases on its three platforms," Finkelstein said. "Whether CA can provide enough money and new technology to catch up is not clear to me yet."

But he said ADR stands to benefit from CA's products on a wide range of platforms from multiple hardware vendors, which ADR lacked both as an independent company and under Ameritech.

Separately, CA continued to roll along financially, announcing an 81% surge in profits for the quarter ended Sept. 30. CA earned $29 million, or 35 cents per share, on sales that grew 33% to $223.7 million.

Mid-Atlantic correspondent Robert Moran contributed to this story.

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In database effort, DEC woos third parties

BY AMY CORTESE
CW STAFF

In an apparent effort to shore up its database offerings, Digital Equipment Corp. has announced a series of agreements and alliances with other vendors, some of which are foes of each other.

Last week, DEC and Relational Technology, Inc. (RTI) announced an exclusive agreement to sell and distribute Ingres tools for RDB, DEC's relational database management system for VMS.

On the same day, Oracle Corp. announced its membership in DEC's new independent software vendor program.

Oracle also reported an extended technology agreement between the two companies. DEC, Oracle and Relational compete ardently in the VAX database arena.

Also in the works for DEC are agreements with Ashton-Tate Corp. and Cullinet Software, Inc.

"What we're seeing is the opening salvo in Digital's strategy to increase utilization of medium and high systems as database servers," said Marc Shulman, director of technology research at Salomon Brothers, Inc. Such a strategy is necessary to maintain the demand for large multiuser systems, he added.

The deal with Relational will see sales forces from both that company and DEC selling a collection of tools called Ingres Tools for RDB.

DEC already had a cooperative marketing agreement with Relational, in which DEC provided support but did not sell Relational products. Under terms of the new agreement, DEC will distribute current and future tools, such as report writers and other development tools. Gateway products are not covered by the pact.

Oracle's agreement with DEC is not a joint marketing arrangement; however, DEC will support the Oracle products. The benefit for Oracle is in the form of an agreement to share technology on both hardware and software, including early releases of operating systems, Decwindows and upcoming hardware such as DEC workstation products.

> ORACLE'S agreement with DEC is not a joint marketing arrangement; however, DEC will support the Oracle products.

The initial focus of the DEC/Oracle agreement is to allow both VMS- and Ultrix-based Oracle products to support DEC Windows, according to Oracle.

According to Salomon Brothers' Shulman, DEC's objective appears to be to increase use of all DBMSs on the VAX, not just RDB. DEC resells many DBMSs, including products from Oracle and Relational in the Ultrix world, in which RDB does not compete.

Group writes prescription for viruses

NEW YORK — Information management policies need a heavy dose of preventive medicine to deal with the current and future rash of computer viruses.

That was the main conclusion reached at the National Computer Virus Symposium, which met here last week to formulate strategies for coping with computer viruses. These technological pests propagate in several ways and could reach epidemic proportions, observers fear, if unchecked.

The two-day invitational event, sponsored by Deloitte, Haskins and Sells and the Information Systems and Security Association, brought together top security experts and attempted to define computer viruses, determine how to detect them and devise methods to prevent them.

Symposium members concluded that present-day antiviral software combats the problem only partially. They looked to the continuation of research for finding comprehensive solutions to the viruses. Equally important, members recommended basing corporate policy decisions on conclusive security risk analyses, buttressed by periodic scheduled reviews of internal policies and procedures.

They also suggested corporatewide restrictions on invalidated and unlicensed software and centralizing the purchase of both software and hardware at the corporate level.

Further, the symposium called for educating users so that they can recognize and understand the effects of viruses.

Members also stated that corporations must be prepared to take legal action.

Peat Marwick sharpens its software focus

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Peat, Marwick, Main & Co. reorganized its consulting arm last week, changing the name of its Catalyst Group software subsidiary to Peat Marwick Advanced Technology (PMAT). The announcement of the change came at a two-day Catalyst users meeting here.

Catalyst is now joined with a Canadian Peat Marwick subsidiary that produces the Silverrun and Goldrun computer-aided software engineering (CASE) products. These two personal computer-based application generators make up the Zerotime Toolset.

Catalyst, based here, sells four CASE programming tools for the Cobol marketplace: the Pathvu software manager, the Retrofit automated restructuring tool for Cobol, the React conversion aid and the Datatec data definition aid.

The new name is intended to identify Catalyst's CASE-oriented software with the Peat Marwick name and so strengthen global marketing of the products, said Howard E. Feinman, director of PMAT's software products division. Catalyst has 500 user sites for its six products — many of them in Europe. PMAT will now go after new sales in the Far East and Australia, Feinman said.

PMAT was officially chartered last Tuesday, following a meeting of several international partners of the Big Eight firm. PMAT plans to employ 40 of its worldwide staff as consultants and 80 more as programmers, said Kenneth M. Coppins, partner in charge of PMAT consulting. That represents a small fraction of Peat Marwick's 60,000 employees.

Still next door

But the new subsidiary is not trying to place its consulting division at arm's length from its traditional auditing services, PMAT executives said. "Local Peat Marwick offices should know of our services and look to us as the technical specialists," Coppins said. That kind of referral would occur in cases of systems conversion or hardware reconfiguration, he said.

Other Big Eight firms have also been restructuring their consulting organizations recently. But most have done so to reduce friction between the conflicting cultures of certified public accountant auditors and information-systems consultants. Arthur Andersen & Co. repositioned its consulting business by renaming it earlier this month [CW, Oct. 17]. The move failed to stop several Andersen consulting partners from bolting the firm last week.

Also, Ernst & Whinney recently moved to bolster its consulting efforts with the purchase of Network Strategies, Inc., a telecommunications consulting firm in Fairfax, Va. As part of Ernst & Whinney, Network Strategies will focus on the strategic, financial and global management implications of the integration of telecommunications and data processing.

Senior Editor Patricia Keefe contributed to this report.

Making memories, 3090 style

BY ROSEMARY HAMILTON
CW STAFF

For the first time, users of IBM's 3090 mainframes have sources other than IBM for memory upgrades as a result of announcements last week from EMC Corp. and Cambex Corp.

But users contacted by *Computerworld* said they are reluctant to do business with companies other than IBM when it comes to critical components of their biggest systems, despite the price advantages of the announced upgrades.

EMC and Cambex separately announced plans last week to ship both central storage and expanded storage upgrades early in 1989. The products will sell for an average of 20% to 30% less than what IBM charges. Both said the products are fully compatible with 3090s and will function in the IBM Enterprise Systems Architecture environment.

Not impressed

Despite these claims, users did not seem impressed. "We have a resident IBM support person because we don't want our 3090 to go down and have to wait for service," said John Scanello, director of information technology at Consolidated Edison Co. of New York. "We would require that from an EMC or Cambex. Otherwise, it's just not worth it."

"You always look at the cost, but you have to look at other things too," said Robert Bruno, planning director at Conoco, Inc. in Ponca City, Okla. "What about local service? We're 100 miles away from the nearest big city."

Louis Finnegan, vice-president of marketing at Cambex, said he was not surprised by an initial reluctance because service "has been the No. 1 issue since the [IBM] 360." However, Finnegan said Cambex offers a variety of service options and will consider assigning a full-time engineer to an account, which is not a standard procedure.

EMC said it, too, will provide a dedicated engineer in certain cases. Similarly, it provides a variety of services, including on-site spare parts.

A 32M-byte upgrade to central storage from IBM costs $270,000. Cambex will sell it for $210,000; EMC will offer it for $189,000 (see chart page 1).

EMC said it will begin shipping the central storage product, available in 32M- and 64M-byte increments, in January 1989, while the expanded storage product, offered in 64M-byte increments, will be released in March 1989. Cambex, which is also offering its products in 32M- and 64M-byte increments, said its products will ship in the first quarter of 1989.

Benchmark

CONTINUED FROM PAGE 1

certainty and doubt]. IBM must be hurt by the DEC performance figures," said John Logan, vice-president of the Aberdeen Group, a Boston-based consulting firm.

Although DEC tested both its own and IBM equipment, IBM tested only IBM machines, specifically: Enterprise System/9370 Models 50, 80 and 90 and a 4381 Model 22. IBM also used a different Debit/Credit implementation.

While DEC reportedly used an implementation of 1,000 terminals, IBM used only about 100.

The smaller number of terminals generated the same number of transactions as the 1,000 terminals in the DEC test, a fact that IBM claimed made the two benchmarks equivalent.

Such testing minimizes the role of a network in transaction processing, however.

"It's mathematically proportional, but performance could vary widely in implementation," Sawyer said. "Any scoring in this area is controversial. There is no way of predicting with certainty what would happen with a full implementation of terminals."

Kenneth MacMorran, manager of IBM's performance evaluation center in Dallas, agreed that the presence of an actual network could affect the performance of a system but claimed the IBM test was a valid implementation of Debit/Credit.

Users, however, expressed skepticism of benchmark claims in general.

"I wouldn't buy a system based on someone else's benchmark," said Ken Carlton, data processing manager at Fleming Foods, a food store chain in Oklahoma City. Carlton tested several 9370 models, running his firm's applications at IBM's Dallas data center prior to purchasing two 9370 Model 90s for distributed locations running under VSE.

"Throughput is the key. I want to know how fast the batch job runs on the system," he said, adding that IBM's Ramp C benchmark more closely resembles his application than does Debit/Credit.

"We have no way of knowing how our application would run on different equipment," said a data center manager at a Midwestern manufacturing company that runs several 4381s. He said IBM's performance claims for the 4381 have been generally accurate.

How it all started

MacMorran said he was responsible for the benchmarks that began the flurry of activity that has gone back and forth between IBM and DEC for over a year. It started, he said, when he tested DEC equipment under IBM's proprietary Ramp C benchmark and IBM published the results.

DEC responded by criticizing Ramp C as proprietary and launching an effort in support of Debit/Credit as an industry standard that led to its July benchmark performance release.

In an effort to impose some objectivity on the testing, Omri Serlin, president of Los Altos, Calif., consultancy Itom International, Inc., started a group, first called the Debit-Credit Council and renamed the TPPC. The group is trying to define a standard Debit/Credit benchmark.

MacMorran said IBM is considering joining the council and in doing so may release Ramp C for the council to work with and define as an open standard. "It's probably a good assumption that we will join."

Ramp C and Debit/ Credit are both valid but are fundamentally different, MacMorran said. While Debit/Credit simulates simple transactions in an automated teller machine network, Ramp C uses a mix of transactions that is more analogous to the work done by many businesses.

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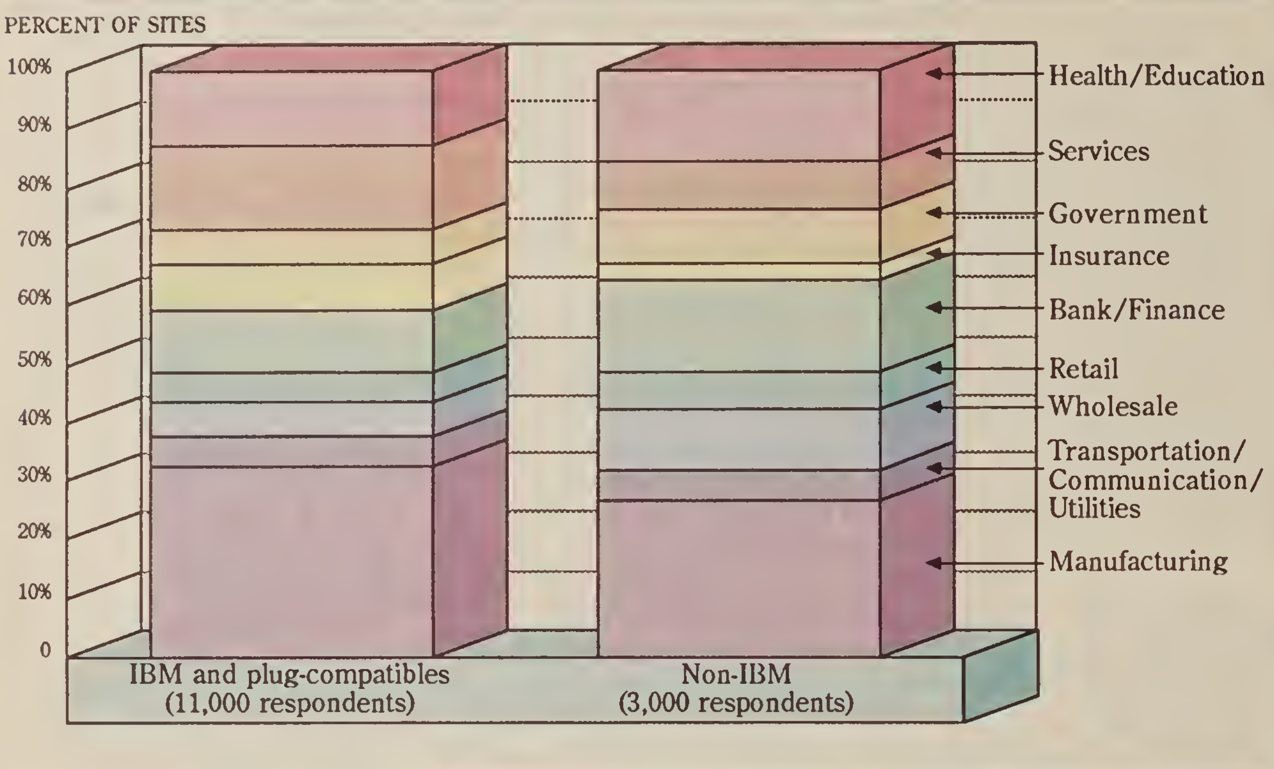
TRENDS

Mainframe hardware

IBM and competitors flex different strengths



The manufacturing industry continues to sop up the lion's share of mainframes sold in the U.S., according to interviews recently conducted by Focus Research Systems, Inc., which tracked the destination of mainframes once they had gone out the factory door.

IBM, Unisys Corp. and Honeywell, Inc. all report a healthy reliance on manufacturing industry sales — more than 35% of Honeywell mainframes are eventually shoved into place at manufacturing sites — with the services industry and the health and education fields also accounting for a significant amount of mainframe sales.

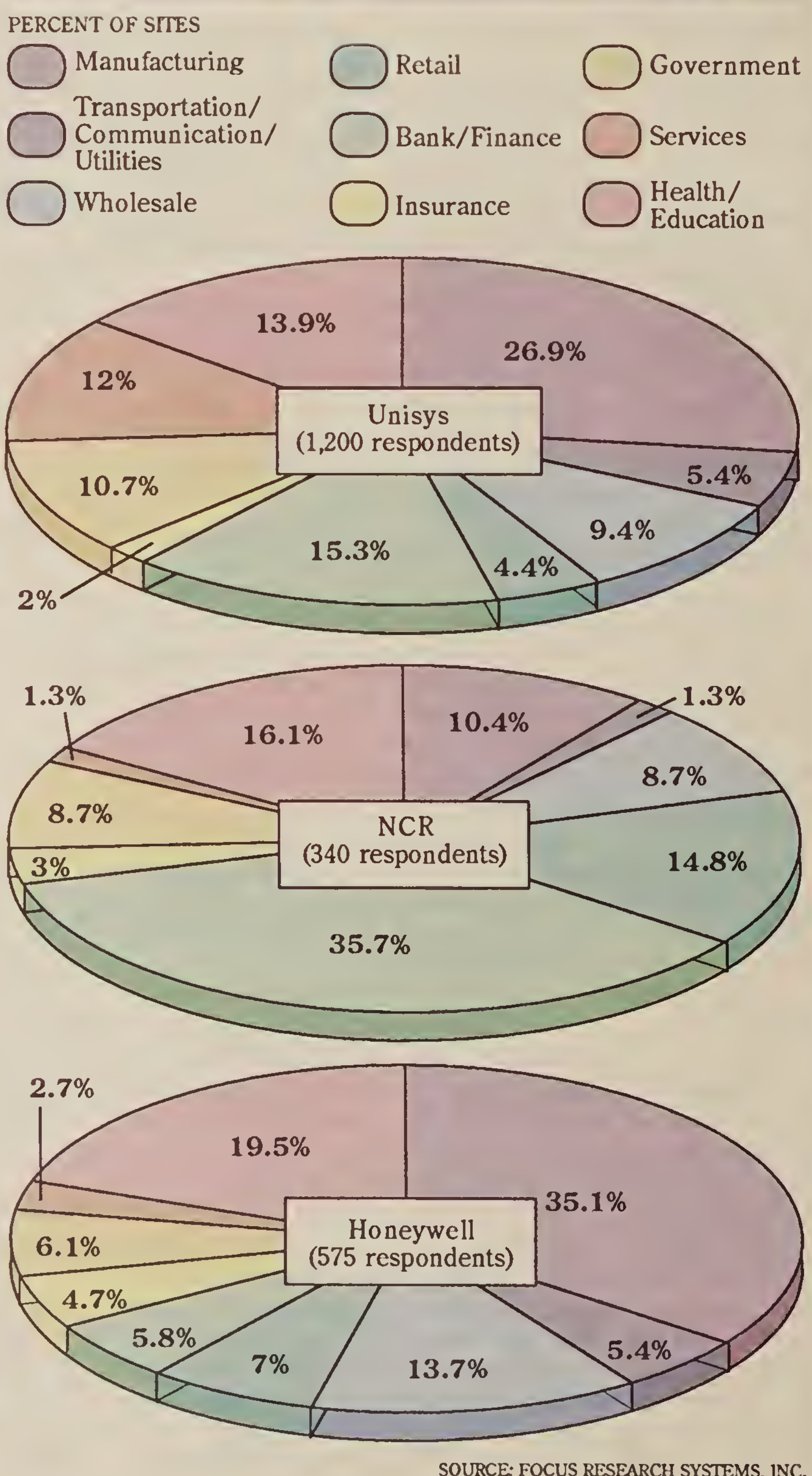
Scott Brown, a researcher at the West Hartford, Conn.-based firm, qualified the conclusions, however, by noting that the manufacturing industry accounts for more mainframe sales than any other industry in the U.S.

Only NCR Corp. appears to have carved out a significant sales niche in another area; nearly 36% of its mainframes wind up in the offices of banking and financial firms. "They've traditionally been very strong in this area because they sell their machines with good applications for banking already built in," Brown said.

The firm's research also indicates that non-IBM machines are making their greatest penetration in the wholesale sellers' market, with Honeywell sending out nearly 14% of its machines to firms in that area. IBM only sends 5.8% of its machines there.

JAMES DALY

NCR shines in financial circles



SOURCE: FOCUS RESEARCH SYSTEMS, INC.
CW CHARTS

INSIDE LINES

Does 'incoming wounded' now cover the *M*A*S*H* campaign? It seems that Hawkeye, Radar, Trapper John, Klinger and Colonel Potter may soon be marching back into mothballs. Now that IBM has switched advertising agencies, the likelihood of the continuation of its ad campaign based on the former *M*A*S*H* characters is in doubt. An IBM representative pointed out that when switching agencies, it is not unusual to drop campaigns and adopt new ones. The *M*A*S*H* campaign has apparently not achieved the wanted results in hyping IBM's PS/2 line. IBM switched ad agencies in September, leaving Lord, Geller to sign on with two New York agencies. Lintas: Worldwide will be handling the desktop portion of IBM's business, while Wells, Rich, Greene will take on the giant's corporate work. Sources report that even though stars like Alan Alda are under long-term agreements with IBM, that would hardly keep the *M*AS*H* campaign going if it were deemed unacceptable.

All around, it was a tough week for DEC. IBM counterattacked DEC with a new benchmark of its 4381s and 9370s, while DEC had to explain why the report on its own on-line transaction processing benchmark won't be out this month as the company promised in July. Long after the stock market had closed Thursday, DEC reported that quarterly earnings were off 17%. Then, when the firm wanted to make a joint announcement with Relational Technology Tuesday, it invited scribes to the Helmsley Palace in New York — but the press conference was actually booked at the nearby Helmsley Hotel. New York police reported sighting roving bands of reporters looking for the event.

Is it worth debating? The hotly contested Air Force CAC 251 contract, worth up to $4.5 billion for 20,000 multiuser Unix systems, is set to be decided Friday after the stock market closes. However, reports now indicate that it might be postponed until after the elections because of Department of Defense concerns that the Dukakis camp might use it as ammunition against defense spending. All indications are pointing toward AT&T emerging as the winner.

The Lloyd Bentsen of software? At last week's ADAPSO Management Conference in Dallas, luncheon keynoter Jim Manzi, chairman of Lotus, said he owed both the industry and his customers an explanation for the delay in shipping 1-2-3 Release 3.0. Then, deftly avoiding the issue for a few precious minutes, he proceeded to rattle off a series of one-liners, comparing himself to the Republican vice-presidential nominee. "What am I planning to do about the delay? First, I'm going to say a prayer, and then we're going to have a meeting. . . . It didn't work for Dan Quayle either." He also reminded his audience that Yogi Berra once said, "A guy ought to be very careful in making predictions . . . especially about the future."

All aboard ISDN. The thin ranks of ISDN supporters among the network equipment vendors are due to fatten up a bit with announcements from Codex and Apollo. One Codex spokesman said the company will introduce an ISDN gateway that can support either asynchronous or high-level data link control, or HDLC, devices sometime late in 1989. Codex is already testing prototypes of such gateways at user sites. Apollo spokesmen said the firm will reveal its ISDN and OSI strategies in the next couple of weeks. They added that Apollo hopes eventually to incorporate an ISDN controller into its machines' backplanes.

So what's wrong with ADOPTSOQ? The professional organization of software and service companies is disgruntled with the acronym that has become its official name, ADAPSO, derived from the weighty title Association of Data Processing and Services Organizations. ADAPSO would like to find a moniker that better conveys who it is and what it does. How about OCONLY, for its defunct dispute over IBM's intentions to supply "object-code only" to customers?

The witching hour approaches, and if you know of any ghosts or goblins prowling about the industry, call Computerworld *News Editor Pete Bartolik at 800-343-6474 or 508-879-0700.*

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